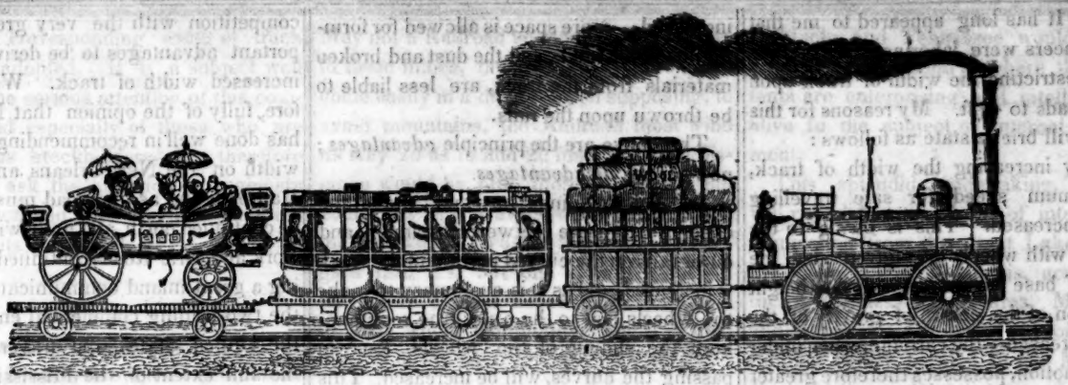

AMERICAN RAILROAD JOURNAL,

AND ADVOCATE OF INTERNAL IMPROVEMENTS.

PUBLISHED WEEKLY, AT NO. 132 NASSAU STREET, NEW-YORK, AT FIVE DOLLARS PER ANNUM, PAYABLE IN ADVANCE.

D. K MINOR, and GEORGE C. SCHAEFFER, } EDITORS AND PROPRIETORS.] SATURDAY, JANUARY 23, 1833. [VOLUME V.—No. 3.

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AMERICAN RAILROAD JOURNAL.

NEW-YORK, JANUARY 23, 1836.

It is much to be regretted that the Canal Company should try to throw obstacles in the way of the liquidation of this claim. They should, by all means, release the trade of the Canal from its present vexatious embarrassments, by an honorable settlement with Mr. Randel.

From the New-Castle Gazette.

John Randel jr., vs. The Chesapeake and Delaware Canal Company.

TO THE PEOPLE.—The Attachment Causes, decided in the State of Delaware, to which I was plaintiff, and the Garnishers of the Chesapeake and Delaware Canal Company were defendants, have been decided in my favor by the Supreme Court of the United States, by dismissing those cases for want of jurisdiction, with costs—thus leaving the decision in Delaware, that I have the right to attach the tolls of this Corporation in the hands of the persons having the direction of vessels passing through the Canal, *final and conclusive.*

After a law suit of *more than ten years*, in which every decision on the merits of my cause, whether in Delaware or Maryland, or in the Supreme Court of the United States, has been in my favor,—after expending a large amount of money in legal controversy to vindicate my rights, and protect my reputation against this Company, I have *at last* reached the Court in the last resort; and having obtained the last decision of the last Court which *can be* applied to, I now give public notice of the fact;—and I invoke the judgement of the public, against the further continuance of the means which have been adopted to ruin me.

This Company now stands, by the judgment of the Courts, convicted of the charge of compelling captains of vessels to pay *double toll*,—the very charge which they endeavored to make against me, when *they themselves* were the extortioners.

I have, according to the decision of the Courts, a right to the tolls to pay my judgment, which, as it is now amounts, with interest and costs unpaid, *to more than two hundred and fifty thousand dollars*, it will take me some years to collect; and I hereby forewarn all persons having the direction of vessels passing through this Canal, that I will enforce my claim, to the end, that such as pay tolls to the Company or their toll gatherers, in violation of the charter, may never hereafter plead in excuse for their act, their ignorance of my rights.

JOHN RANDEL, jr.

New-Castle, Del. January 30, 1836.

☞ Editors in places interested in the trade of this Canal, are respectfully requested to insert the above notice in their respective papers. JOHN RANDEL, jr.

TRUE SYMPATHY.—Should a corresponding feeling pervade every friend to our different periodicals, *to the same extent*, it will go very far towards replacing what they have lost.

J———, Dec. 25, —35.

DEAR SIR.—I cannot manifest my sympathy with the citizens of New-York generally, and you particularly, for the immense loss of property by the late conflagration more convincingly, and perhaps not more satisfactory to you, than by rewarding the industrious for their toils. At present, however, this appears to me one of the proper steps to be taken, and I accordingly forward you $5 for the fifth volume of the Railroad Journal.

I hope the late disaster will not dishearten the citizens in the attempt to renew the charter of the New-York and Albany Railroad. If the charter should be obtained by the friends of the Road at the approaching session of the Legislature, by the time the stock could be put in market the loss would be measureably retrieved. The inhabitants along the route in this vicinity are ready to co-operate with the citizens in such measures as may be thought necessary to secure success to the enterprize,

Yours sincerely,

J——— A———.

We also hope, with the writer of the foregoing letter, that renewed efforts will be made to accomplish this important work.—It is unquestionably of immense importance to this city—of which we would suppose no more conclusive evidence would be required than is now *realized* in the very high price of provisions and fuel, and the difficulty of travelling between here and Albany.

BEST WIDTH OF RAILROAD TRACKS.

To the Editor of the Railroad Journal:

Sir—In a late number of the Railroad Journal, I observe a communication from the President of the New-Orleans and Nashville Railroad Company, in which it is stated that engineer H. J. Ranney, Esq., of that road, proposes an increase in the width of the Railway track, viz. 5½ feet, instead of 4 feet 8½ inches, the width generally adopted, and requesting the opinion of professional men on the propriety of the

change. It has long appeared to me that our engineers were laboring under a mistake, in restricting the width of track upon our Railroads to 4⅔ ft. My reasons for this belief, I will briefly state as follows:

1st. By increasing the width of track, the maximum speed for safe travelling may be increased. This is owing to the fact, that with wheels of a given size, the breadth of base compared with the height or elevation of the centre of gravity of the load is increased—the carriage, when under an equal motion, possesses therefore greater stability, and will bear a greater speed without increasing the danger of "flying the track."

2d. The diameter of the wheels may be enlarged, and the carriage possess equal stability, and under the same rate of speed the engine would make fewer strokes. The advantage of this is evident. In high motions, it would result in a saving of power. The movement of the piston being slower, the expansive force of the steam would have greater effect. There would be less friction, less wear and tear of the parts of the engine, more steadiness of motion, and less frequent occasions for packing the piston plate, and repairing and tightening the joints.

3d. The narrowness of the tracks upon our Railroads, has been the cause of great inconvenience in the construction of engines, the space being insufficient for the requisite size, and proper arrangement of its parts. This is a consideration of great importance in a practical point of view, and is entitled to great weight.

4th. By increasing the width of the track, the motion of the carriages will not be as much affected by any slight depression or irregularity in the rails. This is likewise a consideration of importance, particularly in a country where, from the powerful action of the frost, it is so difficult to preserve a level and even surface to the road. The irregularities which may exist in the surface, will be less liable to be increased by the working and pitching motion of the engine and cars, and as the motion will be less unsteady, more uniform and regular, a favorable effect will be experienced, in contributing somewhat to the efficiency of the motive power.

5th. Adding to the width of the track, and as a more equal bearing of the load upon each wheel, and upon the rails—the carriages are rendered more commodious for passengers, and better adapted for the conveyance of various kinds of freight, and are in all respects more safe,—the capacity of the road for business is at the same time increased,—more space is allowed for forming the horse track, and the dust and broken materials from the track, are less liable to be thrown upon the rails.

The above are the principle *advantages*; now for the *disadvantages*.

1st. By widening the track, the difference in curvature between the inner and outer rails on the curved portion of the track is increased, and as it is customary to make the wheels fast to the axles, the resistance from the sliding of the wheels, &c., in passing the curves, will be increased. This is, undoubtedly, the most serious objection that can be urged. By increasing the width from 4 feet 8½ inches to 5½ feet, the sliding will only be increased the one-sixth part. The extent of the minimum radius of curvature in most roads, is about 400 feet.—The resistance on a curve of this radius for a level road of the usual width, has been found to be abont 4½ or 5 pounds for each ton weight, over and above what it is upon a straight and level road. Assuming that the increased resistance is in proportion to the sliding of the wheels, which is probably as great an allowance, as the circumstances of the case will warrant; and we find the resistance augmented in consequence of widening the track or 5½ feet upon the same curve only 12 to 14 ounces, for each ton weight, and if estimated for the average curvature of the curved portions of different Railroads, will be found not to exceed one or two ounces for each ton weight, an amount too small to be put in competition with the important advantages to be derived from the greater width.

2d. Another objection is the increased length which must be given to the turnsout. This again is an item of minor importance, the addition to the length not exceeding in each case more than 8 or 10 feet.

3d. By widening the track, the cost of forming the road-bed and the superstructure will be somewhat increased. On a road-bed 26 feet wide, an ordinary width, this expense need not be increased for the wider track of 5½ feet more than the fortieth or fiftieth part on the average; and as it regards the superstructure, the additional expense is simply the cost of adding 9½ inches to the cross-ties, if there are any which, if they are of wood or iron, will not much exceed $100 per mile, for a single track.

4th. The remaining objections are scarcely deserving of notice—they are the extra cost of carriages, and the cost of 19 inches additional width of ground. These, like the preceding which I have noticed, can have but little weight, when placed in competition with the very great and important advantages to be derived from an increased width of track. We are, therefore, fully of the opinion that Mr. Ranney has done well in recommending the greater width on the New-Orleans and Nashville Railroad, and as that road must ultimately be continued north, and unite with the New-York and Erie Road continued west, forming a great inland communication between the two leading commercial emporiums of the United States, and traversing nearly the full extent of the Mississippi Valley; we would recommend to those interested in the latter road, to adopt the same width, which in the present incipient state of affairs, they can do without a sacrifice. As it regards the route from Albany to Buffalo, it is perhaps too late to make the improvement, but we undesstand the subject has been presented in its proper light to the Directors of the Auburn and Syracuse Railroad Company, by their Engineer E. F. Johnson, Esq., and that but one sentiment of approval is entertained in relation to it. The Auburn and Syracuse Road being a link in the same chain with the Mohawk and Hudson and the Utica and Schenectady Roads, and as the less width has been unfortunately adopted on those roads, Mr. Johnson, to whose discretion, we understand, the subject has been left, may feel it incumbent on him to conform to the standard which has been established on the roads mentioned. We hope, however, that he will deliberate fully before he decides. For on our part, we are of opinion that the 95 miles of temporary railway from Albany to Utica, should have but little influence in preventing so essential an improvement being made on the 250 miles which remains to be constructed from the latter place to Buffalo, besides an equal extent of lateral branches, which at no distant period will be constructed west of Utica. SMEATON.

Utica, Jan. 2, 1836.

We are truly obliged to "SMEATON" for the preceding communication. It relates to a subject of vastly great importance, as we are induced to believe, than it has been generally allowed. We recollect to have conversed with Mr. Ranney upon this subject, when he passed through the city last fall on his way to Europe; and were much pleased with the bold views which he expressed upon the subject.

Mr. Ranney *was*, and we *are*, fully of the opinion expressed by "Smeaton," that the *New-Orleans and Nashville* and the *New-York and Erie Railroads* are destined to form parts of one and the same road—and

therefore, a corresponding width of track should be adopted. It is a subject well worthy of the serious attention of this community; and especially of those who are interested as stockholders—we therefore respectfully ask the attention of engineers to the subject, and offer the columns of the Journal for its discussion.

No. 1.

To the Editor of the Railroad Journal:

Sir,—I ask leave, through the columns of your valuable Journal, to address the citizens of New-York on a subject of very great importance to their interests.

Hear! O Wall-street! and give ear! Broadway!

Have you a map of New-York, Pennsylvania, and New-Jersey? It is before you. Very well. Place one point of your dividers at Pittston, the mouth of the Lackawana, (20 miles below Carbondale,) in Luzerne county; place the other point at the city of New-York. Now measure the distance on your scale. Behold! the distance is only one hundred and six miles! And what of that? Why, gentlemen, Pittston is one of the finest deposites of Anthracite Coal there is in the world.—Numerous mines are already open. There are none richer, purer, or *easier* to be wrought in earth. It is true, the city of New-York is within 106 miles of the very best anthracite coal mines. How important coal is to your city, for fuel or commerce, I need not say. What quantity you use, or ship abroad, I cannot tell. This I know, the number of tons is very great, and annually increasing. Where does it come from? First, from Mauch Chunk, by Railroad, Canal, and tide-water transportation, one hundred and sixty miles.—Second, a part comes from Carbondale, one hundred and twenty-four miles, to the Hudson, and then down the river near ninety miles more, making 214 miles. Thirdly, from Schuylkill, and perhaps the largest quantity. The distance by Raritan Canal:

Railroad to Pottsville,	5 miles
Canal to West Philadelphia,	106
Round to East Philadelphia,	15
To Bordentown,	28
Canal to Brunswick,	43
Tide to New-York,	40
	237 miles.

Being an average distance of two hundred and five miles. And yet the richest coal mines in the country are within one hundred and six miles of your city.

Is not this a matter of interest to you? May it not be turned to very great account? May not a Railroad be made from your city to those mines, on which cars of coal can come easily in a day? Even supposing, to avoid mountains, the Railroad most wind its way so as to add 20 miles, still the distance would be little more than half that your coal now travels which comes from the Schuylkill. Vastly important as I regard this, it is but one view of a subject that wears another aspect of deep interest to your whole community, which I shall treat of in my next. CLINTON.

We are indebted to a friend for the following interesting letter in relation to the proposed works of Internal Improvement in the youthful yet giant State of Illinois. The true spirit of Internal Improvement is abroad in the *West*, and will, beyond all question, make it the garden of the world.

Greenville, Bond Co., Illinois, Jan. 20, 1836.

Dear Sir,—The Legislature of this State have just adjourned, after passing several acts of incorporation, for the purposes of Internal Improvement. The most important of these are, the Central Railroad bill, and the Wabash and Mississippi Railroad bill. The last commences at the termination of the Maumee and Wabash Canal, and is to end at Alton, on the Mississippi, completing the line from the city of New-York to the Mississippi River, by the New-York and Erie Railroad.

The Central Railroad is to strike through the heart of the State, from the Illinois and Michigan Canal to the Ohio River, running midway between the Wabash and the Mississippi Rivers, through one of the most fertile and delightful regions of the West. The work will commence at or near Ottawa, and pass through the counties of La Salle, McLane, Macon, Shelby, Fayette, Marion, Jefferson, Franklin, and Johnson, to the best point on the Ohio River.—These counties lay in the most direct route, but the Commissioners may vary it as the interests of the public require. The southern termination is to be at or near the mouth of the Ohio River, and the northern at or near the termination of the Illinois and Michigan Canal. From the northern point, a branch is contemplated, to strike the Upper Mississippi at Galena. From the southern extremity, or near it, a branch from the main stem, to cross the Ohio above the mouth of the Cumberland, would communicate with the Nashville and New-Orleans Railroad. The distance from the Ohio River at that point, to Nashville, being *less than one hundred and thirty miles*. It would cross Kentucky through Princeton and Hopkinsville. The route through Kentucky and Tennessee would intersect a fine tract of country, where the inhabitants are enterprising and intelligent, and alive to the subject of Internal Improvement.

This splendid undertaking, therefore, will complete a grand line of internal communication from the great Lakes through the whole length of Illinois, across Kentucky, Tennessee, Alabama, Mississippi, and Louisiana, to the Gulf of Mexico, running nearly parallel to the Mississippi River, at the medium distance of a hundrod miles.

The names embraced in the act of incorporation include a large portion of the most intelligent and influential men in the State. The name of the Hon. SYDNEY BREESE should be remembered among the earliest projectors of this undertaking. He was the first man who recommended it to public notice; and we are indebted to his persevering efforts for the early maturity of the scheme.

I cannot close my letter without expressing my satisfaction at the acceptable manner with which your Journal is conducted. You are rendering the public an important service, by giving energy and character to the progress of Internal Improvement.—You have my hearty concurrence in the measure of raising the subscription to five dollars. Inclosed you have five dollars, U. S. Bank note, for my next year's subscription. Please send to Judge Breese, by mail, to Carlyle, Illinois, the whole of your Railroad Journal from the commencement, and he will remit the amount of your bill.

With the best wishes for the success of your valuable publication,

I remain your friend,

W. S. W.

D. K. MINOR, Esq.

Buffalo, Jan. 12, 1836.

MR. MINOR,—A friend has just loaned me your December No. of the Mechanics' Magazine, in which I find the communication I sent you last September, for the Railroad Journal, upon the plan of constructing Railroads. I regret the necessity of troubling you farther upon this subject, but as I have been so unfortunate as to be wholly misunderstood by you, I have little hopes of better fortune with your readers, without further explanation.

In your prefatory note to the article, you say my plan of constructing Railroads "will be found useful in many parts of the country, *for passing soft or marshy ground.*"—Now, so far from this, the plan *will never answer for such ground, under any circumstances*, nor was it ever intended it should. The present method of building, upon such

ground, wants no improvement: and if it did, this structure could never be sustained upon it.

Again, you say it may be useful "for the construction of cheap roads." If the plan has any merit, it is that of giving, *at a medium price, a better road than any of the plans now in use*—whatever their cost of construction.

In specifying the proper kinds of timber, you have printed "beach, cedar, and locust." I wrote "*red* beach," &c., as some varieties of that wood will not survive a single year's exposure, without marks of decay. Respectfully, yours,

R. W. HASKINS.

Note.—I requested that two or three copies of the article might be sent me, when published, but none have come to hand. I should still be glad of them, as also, of such remarks, if any, as you may publish thereon, from other pens. Did the article appear in the Railroad Journal, for which work it was sent you? It was for the readers of *that* work, more particularly, that I designed it, &c. R. W. H.

We feel grateful to those who contribute descriptions of useful inventions, in relation to Railroads, and therefore give the above explanation, as a matter of justice to our correspondent—with the remark that, from a single perusal of his first article, we formed the opinion expressed. If it was erroneous, our readers will surely not be led astray by it, as they usually form their own opinion from the facts, without regard to ours. We regret exceedingly that he did not see the number of the Journal in which it was published, and can apologise for the omission only by saying to all who require extra copies of the Journal, that we are too *poor* to pay for the *engraving*, and then send duplicate copies of it to gentlemen who think enough of the work to desire their plans and inventions to appear in its columns, yet not enough to aid in sustaining it by subscribing for it. When they shall, as we, have devoted all their leisure hours for *four years*, and expended *three thousand dollars*, over and above the *entire receipts* in return, to establish a work which shall aid and promote the works of Internal Improvement of the country, without receiving a penny for their pains, then, perhaps, a community of feeling may exist, which will induce us to procure engravings, publish their descriptions, and then send the work, gratis.

It may be said, and perhaps with truth, that the investment was injudicious. We *believed* it perfectly good—and do not now doubt but that it would eventually have proved so, if we had not had the misfortune to lose almost our entire stock of back volumes and printing materials, worth over *five thousand dollars*, by the late conflagration. *Now it is an entire loss*, and therefore every person interested *in*, or connected *with*, Railroads, is solicited to aid in sustaining the work, not only by his own subscription, but also by inducing others to *be alike*—wise. Its Editor, like old "*England expects every man to do his duty*," by forwarding a few *additional* subscribers as early as possible, with the *advance* subscription.

We publish in our columns to-day, extracts from a very interesting letter addressed to the Committee of the Alabama Legislature, on the subject of Railroads, by Mr. J. F. SCHERMERHORN. The large and liberal views developed in that letter, and the intimate acquaintance with the localities of the vast regions of the west, acquired by Mr. Schermerhorn, in the discharge of his official duties as Indian Commissioner, entitle his remarks to an attentive consideration. It will be perceived that the Legislature of Alabama has granted a charter on the plan recommended by Mr. Schermerhorn.

Tuscaloosa, Nov. 24, 1835.

Sir,—I find, in travelling through the western States the past season, that there is a great movement among the people on the subject of Internal Improvement, especially by the construction of Railroads; and as the people of Alabama are at present assembled in a convention on this subject, and your Legislature will soon be called to act upon applications of this kind; I take the liberty to address to you some considerations in reference to them, which will be found worthy the serious consideration of every statesman and friend of his country.

The experiments that have already been made, have sufficiently developed the practibability and utility of Railroads, to transmit commodities and facilitate intercourse between different sections of the country. If internal improvements could be extended through the States generally, so as to connect the trade and intercourse between the several principal commercial places and cities in the valley of the Mississippi, with those on the Atlantic coast, a great national object would be effected, the advantages of which, as respects personal convenience and comfort in travelling, the advancement of private property, the general circulation of intelligence and useful knowledge, and its political bearings and influence to bind together the several States of this Union by indissoluble bonds, that of self-interest, the means of security and safety, they would afford each other in times of difficulty and danger, whether of a foreign or domestic nature, it is utterly impossible to calculate. There are certain great leading routes which are necessary to be established through the different States for the acomplishment of these great designs, and which the natural face of the country points out as the most eligible. I will take the liberty to point out some of those which the general interest of the country requires to be constructed; but I shall notice only such as pass through more than one State.

1. *The Northern Atlantic and Mississippi Railroad.*—This, it is proposed, should commence at Boston, and pass by the most convenient route to Albany, New-York, from thence, by Utica, Rochester and Buffalo, to Erie, in Pennsylvania; from thence to Cleveland and Maumee, Ohio, through Michigan and Indiana, by Michigan city and Lake, to the Mississppi and Jefferson city, Missouri. The distance of this road will be about 1500 miles.

2. *The Southern Atlantic and Mississippi Railroad.*—This will extend from Charleston S. C. to Augusta, Eatonton and Forsyth, to West Point, on the Chatahoochee; from thence to Montgomery and Woodville, Alabama, by Jackson, Missisippi, to Vicksburgh, a distance of about 712 miles.

3 *The Atlantic Coast and New Orleans or Union Railroad.*—This road, it is proposed, should extend from Augusta, in the State of Maine, by Portsmouth, N. H., Boston, Ms., Providence, R. I.. New-Haven, Conn., to New-York city; and from thence by Newark, New-Brunswick, and Trenton, N. J., to Philadelphia; thence by Port Deposit and Baltimore, to Washington city; thence by Richmond and Fredericksburg, Va., Raleigh, N. C., Columbia, S. C.; thence to Augusta, Georgia, until it intersects the Southern Atlantic and Mississippi Railroads, and thence with the line of said road by Eatonton and Montgomery to Woodville, and thence to Mobile and New-Orleans, distance of about 2000 miles.

4. *The Baltimore and Mobile and New-Orleans Railroad.*—This will extend from Baltimore to Harper's ferry, which is already constructed, then by Winchester, Staunton, and Abbington, Virginia, to Knoxville and Kingston, to the Tennessee River at Brown's ferry, near Look-out mountain; thence by Wills Creek Valley and Woodville, to Mobile, a distance of about 1050 miles, and from thence to New-Orleans.

5. *The New-Orleans, Mobile, and Michigan Railroad.*—This it is contemplated shall run from New-Orleans, by Jackson Mississippi, to Columbia, Tennessee; and from Mobile by Tuscaloosa and Courtland Alabama, also to Columbia; thence by Nashville to Louisville, Kentucky, and Indianapolis to Michigan city and the Lake, where it will also intersect the Northern Atlantic and Mississippi Railroad; and in passing the Wabash river it will also intersect the Lake Erie and Wabash canal.—The distance from from Mobile is about 900 miles, and from New-Orleans about 1,000 miles. The whole length of these five Railroads, if completed, would not exceed 6000.

In designating the above proposed routes of Railroads, I have endeavored to divest myself of all sectional partialities, prejudices, and interest, and to have my eye fixed only to promote the general interest of every section of the Union; and therefore you will find they pass through almost every State in the Union; and should these works ever be constructed, they can be so locat-

ed as to do so. It can admit of no doubt, if these improvements were made, the public interest would be greatly promoted, and it is an object, therefore which the citizens of every section of our Union must desire to see accomplished. It must however, be evident to all, that to effect this, a spirit of accommodation and compromise, which alone can produce harmony, and unity of design and action is indispensibly necessary, as well as a vast amount of cash capital,far beyond the ability of those most concerned in it, can at present command. The following plan is therefore submitted for obviating the objections that have been started, and for completing the works designed.

I am well apprised that a considerable portion of Railroads have already been constructed in the lines of these routes by private corporations, and that some difficulties may arise on that account in establishing them. It is, however, believed that these may be combined and connected with one great company for the constructing and completing any of these entire routes on just and equitable principles; which shall equalize the profits arising from the whole, and secure a general system of operations, by which the benefit and interest of all will be promoted.

The plan which I would propose is the following: let five great companies be organized to construct and complete these five great national works of internal improvements, to be incorporated by all the States through which they may pass, and with a capital suficient to furnish them in the best and most substantial manner. If, however,this cannot be done, let eaeh State incorporate a company or companies for the construction of these works and other similar works in their own States. The stock to be divided into shares of one hundred dollars. Each State shall have the right to take one-fourth of the stock necessary to construct roads within the same; and the United States shall have the privilege to take one-fourth of the entire stocks in all the Railroads, and the balance to be taken by citizens of the United States only; but the citizens in each State, in the first place to have the right to take the whole amount of stocks created for the building of the roads within the same, and which shall not have been taken by the State or the United States. The amount of stock subscribed, and finally apportioned to the several citizens, by the Commissioners and Directors appointed by the act of incorporation, shall be secured by mortgage on real estate, with interest payable semi-annually, and the principal payable in twenty years; the same to be appraised by Commissioners appointed for that purpose by the Legislature or Governor of the State. When these mortgages and the Railroad and income of the same shall be pledged to the State, the State shall make a loan for the benefit of the Railroad Company, either from the United States, from her surplus revenue, if any; and if this cannot be done consistently with the principles of the constitution, then from the citizens of the United States, or the citizens of any foreign nation, to be redeemable in twenty years, or any time thereafter, at the pleasure of the States. The whole details, as it respects the number of Directors in each State, the manner the monies shall be drawn and expended; and the division of the profits so as to equalize the same among all the stockholders in the different States; the manner in which the stock may be transferred, and the mortgages cancelled and others substituted for them, can and must all be adjusted, and satisfactorily secured in the several charters; in which, however, there should be an express provision, that the rates on the road should be adjusted from time to time, that the nett income of the roads shall not yield the stockholders more than fifteen per cent., or the first construction of the road after the loan has been paid off and redeemed.

It is believed that if this plan is adopted in any State, there will be no difficulty in having the whole amount of stock taken and adequately secured, for making every possible improvement, in each State that will warrant the undertaking, The advantage to the stockholders must be manifest to every one, for by paying the interest only on their stocks, while the roads are constructing, without depriving themselves of the use and occupation of their plantations, or jeopardizing their property in the least, or diminishing the value of them; but instead of this, actually advance it one hundred per cent. the moment these works are completed, and ultimately, when the loans are paid off, from the profits of these roads, which may be the case even in 10 instead of 20 years, they will have the whole amount of their stock free, and for what has comparatively cost them nothing. So that it must be evident to all there can and will be no difficulty in disposing of their stock to complete the roads, if the States will lend their aid to their own citizens in this matter. And here let me ask, why should not every State in the Union do this, for the benefit of the commonwealth generally? She can sustain no possible loss or risk in doing it, for she is triply secured for the responsibility she assumes in making the loan—first, on the real estate mortgaged at its present value—second, in the increased value of the property mortgaged, by making the improvements contemplated; and thirdly, by the road and entire nett income thereof, until the loan is paid. But from this the States may receive other benfits: by investing her public stocks for common schools and university funds, if she has any, and if she has none, she may now create them by taking a portion of the stocks of these companies, and finally, pledging the income of them after the loan is redeemed, for such purposes, which will enable the States to extend the blessings of education, and the diffusion of benefits of common schools to their entire population. But the State of Alabama will have another peculiar advantage in making such loans for the purpose of making the contemplated improvements within her State. Her loans will be deposited an aa additional banking capital of several millions of dollars for twenty years, which costs them nothing, and the advantage of which alone will enable her to take one forth of the entire stocks of these roads. which is self evident in the end can cost them nothing. And with such a fund devoted to the benefit of common schools and the advancement of science, what an immense benefit will she confer upon her population, and what a glorious example will she set for her sister States.

The general diffusion of these stocks among our own citizens, especially the planters or farmers, and mechanics, will greatly stop the stock-jobbing system, and prevent them in a great degree from ever going out of the country; and this certainly is an object of great public importance. There is no doubt that foreign capital is now very extensiveiy employed in banking institutions and in making our internal improvements; and as long as it is done in the way of loans to States, and they do not own the stocks of these companies, there can be no objection of it, because there is a security, the loans will be redeemed; but if foreigners once become stockholders of our works of internal improvements, which of necessity are corporations of perpetuity, the country never can be relived from this incubus; and we must become tributary to foreigners, and every step which leads to such an event ought to be deprecated and avoided. And, under all these circumstances, who can doubt for a moment whether the Legislatures of the several States will not readily accommodate their people in this respect, and thus promote the general welfare.

The General Government of these States is also greatly interested in having these improvements made both as respects public utility, and in the economy and facilities which will be thus afforded for carrying on the operations of the government. This will be seen in strengthening and increasing the bonds which cement our Union, by the social relations of life, which will be increased and extended—by equalizing the advantages to be enjoyed—by furnishing markets for the productions of every part of the country—by the commercial relations which will thus be extended and increased, and by the means that will thus be afforded in times of war and insurrections, of concentrating the whole force of the country at any given point in a very short time. The saving also will be great to the nation in the transportation of the munitions of war, subsistence and transportation of troops,and in dispensing with the necessity of making several military works tor defence, but especially in the transportation of the United States mail. For the time has already come when the Post-Office department will require the action of the government on this subject, in order to prevent impositions from Railroad corporations. The Congress of the United States will be constrained either to make post roads of this kind, for the conveyance of the mail, or else encourage the construction of Railroads, by making loans or taking a portion of the stocks and entering at the same time into some special arrangement for carrying the mails at certain rates on said roads, for the patronage she thus extends to these in prove-

ments. If the United States were to take one-fourth of the stocks in the Railroads before mentioned, it is believed the nett annual income from them to the Government would be sufficient of itself to pay the entire expense of the Post-Office department. This would enable Congress to reduce to a mere nominal sum the postage on letters, and to make free entirely the postage on all newspapers and journals of science, and magazines of useful knowledge, which would have a great tendency to diffuse very generally useful information on the subjects of politics, science, and religion, throughout the whole of these United States. But this is not all: unless mails can be conveyed in some other way than they are now conveyed, there must be a limit to our accommodations by mails, or else we must have them at an increased expense, for they are now frequently overburthened; and what must they be in a short time, with the increased population and business of our country. The public domain through which they may pass will also be greatly enhanced in value by these improvements, and it is a question whether the Railroad companies should not receive from Congress a portion of those lands, or a certain per centage on these within a certain distance of the road, the minimum price of which should be advanced one hundred per cent.

I trust, sir, that although I have only alluded to many important advantages which would result from the construction of these Railroads, to the private stockholders, to the public generally, to the several States interested in them, and to the United States; still sufficient, I think, has been said to show that the plan for raising funds to execute the works proposed, is safe, practicable, and important; and if the few ideas which have been suggested shall have a tendency to promote the general welfare and prosperity of our common country, I shall feel myself highly honored and rewarded.

I am, with great respect,
Your obedient servant,
JOHN F. SCHERMERHORN.

Col. J. W. LANE, Chairman
of the Com. Internal Improvement of the Senate
of the Legislature of Ala.

ENLARGEMENT OF THE ERIE CANAL.—The subject of enlarging the Erie Canal is one of such vital importance to this community, that we shall deem it our duty to devote considerable space to it.

The annexed article from the Albany Argus, and another from the Commercial Advertiser, in relation to the enlargement and termination of that work, should be read with attention.

INTERNAL IMPROVEMENT.

ENLARGMENT OF THE ERIE CANAL, AND COMPARATIVE VIEW OF A SEPARATE WORK.

The N. Y. Legislature, at the last session, with a liberality for which no example can be found in the annals of American Legislation, placed at the disposal of the Canal Board the revenues of the Erie and Champlain Canals, to an indefinite amount, and for an unlimited period—the amount estimated by the Governor to be twelve millions at the lowest, and the period twelve years at the shortest; And this too, without the aid of science to enlighten their deliberations; for not a single survey or estimate was required, as a preliminary to this vast appropriation.

The object sought, and which demanded such unwonted confiding to subordinate public agents, and such bold, precipitate action, was "*the great and growing trade of the far west!*"—not the interior trade of western New-York. In this we were sufficiently secure, and that section of our State had been sufficiently accommodated by an expenditure of 9 or 10 millions.—For *this* trade and for the accommodation of *this* section of our State. therefore, no appropriation could be thougt of while so many parts of the State remained unimproved, and so many projects were untouched. But the prize which impelled the Legislature to immediate action was the trade of the "*far west*"—a prize for which we are to contend with Canada, as well as Pennsylvania, Maryland, and Virginia. With this unbounded grant of money and power, the Canal Board seemed to imbibe the ardor and haste of the Legislature, having *settled* and *revised* their plan of operations, although the Governor informs us that they have not yet acquired the information necessary to an estimate of expenditure approaching to accuracy. These circumstances are detailed to palliate the presumption of questioning either the discretion of the granters or the prudence of the grantees of this ample power.

What is the project, and what are its bearings? Twelve millions at least are to be expended to convert a small boat canal into a large one; and *as the trade has become too important to tolerate interruption*, this expenditure is to be made principally in the winter months, say from the 30th November to the middle of April. A more lavish expenditure of money than this contemplates, cannot be imagined. Indeed, how the various labors of earth excavation, lock-pits, coffer-dams, culverts, masonry, grouting, &c., in short almost any portion except rock excavation, can be achieved in the winter months in this high latitude, is not easily conceived. Practical men pronounce it impracticable, and the best engineers say. that an *entire new work*, by the side of the old, constructed in the proper season, *would cost less* than the contemplated alteration.

As twelve years must be devoted to this enterprize, little benefit can result to us until that period shall have expired, so far as the trade we seek is concerned, for as long as a portion of the canal is contracted in dimensions, small boats once loaded, would proceed through the whole line, instead of transferring their lading to a single large boat, at an intermediate point.

Interest compounded at 5 per cent. while the work is in pr gress, would swell its cost to about 16 millions of dollars. Our rivals would have the field for 12 years to come, with nothing more formidable than our present work to contend against; and when that distant period arrives at which we are to demand three times the amount of western trade that our present canal can accommodate; when we are to challenge our rivals on the north, and on the south, and combat for the prize, it is greatly to be feared that our *enlarged canal* will be burthened with tolls in proportion to its magnitude; unless our exhausted treasury can be replenished and our unproductive canals sustained from other sources than the Erie, and projected improvements in other parts of the State, be *postponed for* 12 *years*. Unless this can be compassed, we shall have enlarged our work without attaining our object.

As it would be both unjust and ungenerous to find fault with our Legislature, and condemn the projects of their agents, the Canal Board, without proposing substitutes, I will venture to submit one for public consideration, which promises to accomplish the same object, for less than half the expenditure of *time and money*, and one that can earn in the remaining half of the period at a reasonable estimate enough to reimburse *all the cost*—that is at the end of 12 years. When the enlarged Erie Canal would begin to refund the 16 millions expended upon it, my canal will have earned enough to reimburse its cost, leaving the Erie Canal and its present revenues untouched. This State will have placed itself in a condition to compete with the western trade within six years, and in 12 years will have saved 15 millions, which, if expended in other works, would go far to satisfy the demands of other sections of the State, numerous as they are. Startling as this proposition is, it is nevertheless made with confidence, and with the hope of provoking discussion and examination.

To the project:—Construct a canal of the dimensions proposed by the Canal Board, (*unless better can be devised*) from Albany to Lake Erie, by the route of Oneida Lake and River, Lake Ontario, and the Niagara—[see Assembly documents, last session, No., 195.] The distance by this route to be canalled will be about 150 miles; 127 miles from Albany to the Oneida Lake, 12 miles round the rapids of the Oneida and Oswego rivers, 9 to 10 miles round the Falls of Niagara—in all 150 miles of *artificial navigation*. The whole distance from the Hudson to Buffalo by the Lake route is 378 miles, which may be reduced to 363½ miles, should the *direct* route from Schenectady to Albany be adopted; giving 223 miles of *natural navigation*, instead of 365 miles by the Erie Canal. The natural navigation is both cheaper and more useful than artificial, even though the latter were not encumbered with tolls.

For the cost of these 150 miles, *better data are furnished* by *former surveys* then are yet afforded for the enlarged route. Mr. Roberts an engineer of acknowledged talents and established reputation, estimates the Niagara Falls portion, in a detailed report, *at less than a million* of dollars, for sloop or "ship navigation." As a

work of less magnitude at this place would not be useful, that portion of the work should be set down at this sum, say one million. Mr. E. F. Johnson, has estimated the cost of a still larger work, viz: 8 feet deep, 90 feet broad at the surface, with stone locks 130 feet long by 30 feet broad, for *steamboats*, from Oswego to Utica, at a little more than a million, ($1,131,989, see his report, Ass. doc. No. 195, page 47.) As this portion of the work may be made to correspond with the Mohawk section, viz: a large boat 7 feet by 70 and 16 feet locks; one million *would be ample*.—That engineer Johnson is good authority, will be conceded by those of the canal engineers at least, who have measured arms and tried their prowess with him: four millions will remain to complete a boat canal from Utica to Albany, *distinct and separate from the present canal*, 7 feet by 70, and 16 feet locks! *If this sum is adequate to this portion of the work, expended in the summer, it follows pretty clearly, that twelve millions are not enough for the whole work on the Erie Canal route expended in the winter.* Now I ask any one to doubt, if they can, that six millions in money and six years in time, (I may say four,) are not as liberal an estimate for these 150 miles of canal, as twelve millions and twelve years are for the 365 miles? If so, this work being achieved six years before the other could be, and having three times the capacity of the old canal, and being able to bear the same toll (if required to do so) as the Erie, it would not be unreasonable to expect from it *thus* charged, an addition of one million in toll per year, on the entire cost of the work in these six years If this work could accomplish so much, there would indeed still remain about one million, upon the principle adopted with the Erie canal for interest on the disbursments, while the work was in progress. The amount at the end of twelve years would stand thus:

Erie Canal *enlargement* would have cost sixteen millions, and nothing refunded.

The *Lake route* canal seven millions, of which six would have been reimbursed, leaving one million against sixteen; or an advantage in favor of the *Lake route* of fifteen millions. ☞Six years earlier competition for the western trade would be achieved, and *a better canal for all time to come.* J. E. B

ENLARGING THE ERIE CANAL.—The enlargement of the canal has, during the last season, been determined upon, at an expense somewhat exceeding its original cost. In carrying this resolution of the legislature into effect, we understand that the canal board intends to rectify the course of the canal in those places where from the inexperience and hasty decisions of the engineers originally employed, the line of the canal was improperly located. At this determination we rejoice.

Every person who has travelled the Erie canal must have observed many places where the route could be judiciously altered. In one part of the canal to which public attention has of late been particularly directed, its length is doubled, besides crossing a river twice in the space of fifteen miles. We refer to the eastern section between Schenectady and Albany. The distance across the country is but 75 miles, and by the canal it is 30 miles. In the present route, too, the canal is twice taken across the Mohawk, and when the aqueducts are lowered three feet on account of the increased depth of the canal, it may well be doubted whether they can be constructed to withstand the spring freshets of that rapid river. It has been proposed to bring the canal direct to Albany as a mode of avoiding this difficulty, and at the same time shortening this section of the canal.

The ground between Schenectady and Albany is a high table land, intersected by deep dry ravines and creeks, which empty into the Mohawk to the north and the Hudson on *the east*. The descent from the Mohawk at Schenectady to the Hudson at Albany, is 220 feet. The height of the table land at Schenectady, is 115 feet above the Mohawk, and at Albany, 185 feet above the Hudson. If this table land should be cut through at Schenectady down to the level of the Mohawk, inasmuch as the table land descends toward Albany, upon an average, 15 feet in the mile, the deep cutting would diminish as the canal advanced from the Mohawk, and in eight miles a line from the level of the Mohawk, would strike the top of the table land.

From that point there would be a continued descent to the Hudson. Even if the table land be cut through, the work is not formidable; but if a proper ravine be chosen, the labor will be much diminished. The object to be obtained is of the highest importance to the west. A saving of 15 miles upon the eastern section of the canal, is a saving of not less than $6 in tolls on every boat entering the Hudson, and the same on the return, making $12 saving in tolls alone on each boat. The saving in time will be five hours each way, making ten hours on each boat, which, estimating wages and expenses of each boat at $1 50 for one day of ten hours, will make a total saving of $13 50 on each boat.

In 1834, there were 32,428 boats arrived and cleared at the Hudson, which, at $6 75 on each boat, would make an annual saving to those navigating the canal of $218,956. Taking the present year as a basis, the saving would not fall short of $250,000, and each year it will probably increase. Should we not, then, earnestly inquire whether this great and annually increasing expense cannot be saved?

The route proposed for this section of the canal by Mr. Randal, who fully examined the ground, was to leave the present canal 600 yards west of Schenectady, and go up the valley of the Sandkill until you arrive at a point one and three quarter miles east of Schenectady, where the deep cutting begins and continues 165 chains at an average depth of 52½ feet to Lyshe's kill, and thence 100 chains, with the same average depth of cutting. Including the ravine Lyshe's kill, the average depth of cutting for the whole 365 chains, or four miles and twenty rods, will be reduced to 48 feet. From this point there is another excavation for 98 chains, of an average depth of 15 feet, along the valley of the Flykill, and thence another through the table land, 150 chains long, and an average depth of 22 feet, to the head of Mill creek, which flows toward the Hudson, and empties itself into that river between Brannor House and the Arsenal.

The estimate of the cost of excavating and constructing the canal at the deep cuttings, has also been made by Mr Randal, and is as follows:

For excavating, &c.,	No. 1,	$488,464
do.	No. 2,	278,488
do.	No. 3,	40,678
do.	No. 4,	148,172
So that the total cost amounts to		$955,802

The residue of the route is all sand and common cutting for six and one-eighth miles to the Hudson River, which is estimated at $30,000. So that the direct route would cost less than $1,000,000, independent of the locks, which are the same on the new as the old route.

Now is the time for investigation, before the State has expended a dollar on the enlargement of the canal. Let the route be fully explored, and let it be ascertained whether the canal cannot come direct to the Hudson, instead of going round by the Cohoes.

[S.]

Baltimore, Sept. 26th 1833.

Sir,—In compliance with your instructions, I have taken into consideration the propriety of causing the graduation of the heavy section (*8th) of the first division of the Washington Railroad, to be executed under the immediate direction of agents of the Company, instead of the customary mode by contract, and recommend it as the most proper course.

It is believed that the graduation of this section, under the most judicious management. and in the absence of the occurrence of extraordinary difficulties, such as iron ore, quicksands, landslips, &c., cannot be effected at a cost less than from eighty to ninety thousand dollars. Very few of such persons as are disposed to become contractors, or such as now are contractors on public works, are in the possession of such amount of funds as are indispensably necessary for the advantageous commencement and prosecution of a work of this magnitude, and the insufficiency of means is not unfrequently the cause of failure, even where the price is ample and the management good. But this section is, from appearances, so very liable to the occurrence of extraordinary difficulties, such as are above alluded to, that no prudent contractor will undertake its graduation without adding to his price such sum as will, in his opinion, indemnify him for the risk. If he does not do this, and any or all of those apprehended difficulties should be met with, his price will of course, prove greatly inade-

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NOTE.—This section was subsequently joined to the 1st section of the second division, and both then called the 1st section of the 2d division.

quate to the completion of the work, and he must abandon it. The Company, by placing this work under contract, cannot gain, under any circumstances, but most probably will lose. They cannot gain by having the work done with the funds of contractor, (and in this way I am sure it is not their wish to gain,) because, if the contractors has an inadeqnate price, and although he may be in possession of the requisite funds, he will not, most probably, expend them for the benefit of the Company and to the ruin of himself; and if his price is based upon the expectation of great difficulties, and those difficulties should not occur at all, or only in part, then his price will be too high, and the Company will be the loser. And again, if his price is adequate and his funds inadequate, he will most likely fail: or if his price and funds are both adequate, and greater difficulties should occur than he expected, a failure must be the consequence.

Failures are greatly to be deprecated, especially in the commencement of a great work, and every possible precaution ought to be taken to prevent them. Their occurrence is highly prejudicial to the interests of the Company and of every one employed by them, because they occasion distrust, riot, and consequent embarrassment, if not great injury to other contractors. The uncertainty of payment causes an advance in the price of every article of value, and in none perhaps more than in that of labor. And if the credit of the line sustains, in its commencement, such a shock, as would be produced by a failure on this section, it can scarcely be expected to recover from it before the work shall have been finished, and the Company must, in the mean time, pay the premium or advance in the price of labor occasioned by it. It will then be perceived that the baneful consequences of a failure on this section, may not be confined to it alone, but will pervade the whole line of Road. And in the event of failure the Company will be compelled either to undertake the section themselves, or again place it under contract, most likely at an advanced price, and with very little certainty that the succeeding contractor will finish it. And finally, after encountering all the moral disadvantages of sever al failures, to pay vastly more than the original value of the work. For these reasons and others which might be named, I would respectfully recommend to the consideration of the President and Directors the propriety of conducting the graduation of this section, by agents of the Company. For this purpose, a principal agent or manager, to be selected by the President and Directors, and to be under the direction of the Superintendent of Graduation and Masonry, will be necessary. This agent should be a man of integrity, fidelity, capacity, and of great energy. The minute details of the work, as well as the selection of the necessary subordinate agents, should be confided to him, as he alone will be held responsible for the judicious and economical execution of the work. The general outlines of the operations and system of accountability will be prescribed by the Superintendent of Graduation and Masonry, whose duty it will also be to see that the principal agent or manager conducts the work, in all its parts, advantageously.

If the President and Directors should concur with me in the opinion that the 8th section of the first division should be placed under the direct management of agents of the Company, I would then respectfully but earnestly, further recommend, for the same reasons, that two other sections be also graduated by the Company. Indeed, there will be additional reasons for undertaking the other two difficult and expensive sections. At any time that an increased force might be temporarily required on any one section, it could be applied from one or both of the other sections. Besides the correct management by the Company, of sections, on different parts of the line, would exert a powerful moral influence upon the conduct of those employed on the whole line, very highly beneficial both to the interests of the Company, and the contractors and laborers.

In the event of those sections being conducted as recommended, I would very respectfully suggest, that if the provisions of the charter justify the measure, and the President and Directors approve it, that the establishment of stores by the Company, at those sections respectively, would prove beneficial both to the interest of the Company and those employed by it. The Company would, of course, sell to their operatives at very moderate profits, and whilst they would thus advance their own interests, would also subserve the interests of those in their employment, by selling to them necessary articles at fair prices and at convenient places, by which they would be saved from loss of time and perhaps from imposition. The superintendency of these establishments would, of course, devolve upon some other officep of the Company than the Superintendent of Graduation and Masonry, whose time would be too much otherwise occupied to attend to them. The establishment of stores which will be conducted on correct principles, and which will save both time and money to the laborers and others in the service of the Company, is considered of so much importance, that I would recommend that the President and Directors should, in the event of their declining to establish them by the Compa ny, afford every practicable facility to such persons as will establish them and conduct them on correct principles.

To such men as are suitable for agents,—men of character,—of long tried integrity, of capacity and great industry, adequate compensation must be given, or their services cannot be commanded: and unless such can be obtained, it would be more advisable to encounter all the hazards, perplexities and difficulties likely to grow out of contracts for such expensive jobs.

From the preceding remarks I do not wish it to be inferred that I am against contracting altogether. I am decidedly in favor of contracting in general, and would only make exceptions in cases of very large extent, or in such as it is beyond the capacity of man to form a correct estimate of the value of the work to be done, because of threatened or expected difficulties that may or may not occur.

In conclusion, I would respectfully remark, that I conceive it to be highly important, that those sections should be in progress of construction as early as practicable.

I am, sir, yours, very respectfully,

CASPER W. WEVER.

To PHILIP E. THOMAS, Esq.
President of the Baltimore and Ohio Railroad Company.

Letter from JAMES SEYMOUR, *Division Engineer of the New-York and Erie Railroad, in respect to the curvature and graduation on that and sundry other roads.*

New-York, January 11, 1836

SIR,—Having recently, in pursuance of your direction, visited and examined the several Railroads between this city and Washington, I beg leave to submit the following account thereof for the consideration of the Board of Directors.

1st. The Paterson and Jersey City Railroad, length 16 miles. The train of cars was drawn by one locomotive engine, from Paterson to the Bergen Ridge, with forty passengers, at the rate of 12 miles per hour, passing over curved lines varying from 400 to 600 feet radius, and ascending a grade for a distance of half a mile, at the rate of 45 feet per mile upon a straight line. The engine ascended this grade with a velocity of eleven miles per hour; over the remainder of the distance, not yet completely finished, the cars and passengers were drawn by horse power.

2d. The Amboy and Camden Railroad, length 65 miles. Over this road the daily trains of cars, containing from 50 to 150 passengers, are drawn by an engine weighing seven and a half tons, at from 12 to 15 miles per hour, ascending a grade of from 40 to 50 feet per mile, for a distance of about 3 miles, upon a part of which ascent there is a curved line of 750 feet radius; the remainder of the road slightly undulating.

3d. The Philadelphia and Trenton Railroad, length 30 miles. This road is nearly level. A train of cars, containing 60 passengers, was drawn over this road at the rate of 14 miles per hour by a locomotive engine weighing 8 tons.

4th. The Philadelphia and Columbia Railroad, length 82 miles. Upon this road there are two inclined planes located for stationary steam power. The first is located immediately west of the Schuylkill river, near Philadelphia. One train of the cars was drawn up this plane by the stationary steam engine, another by horses, and the delay in passing was half an hour. Its length 3300 feet, vertical height 165 feet. Trains containing forty passengers (20 in each,) are drawn from the head of this plane by a locomotive engine of eight and a half tons gravity. The road presents acclivities of 30 feet, and in one instance of 45 feet to the mile, and numerous curves, many of which are from 600 to 800 feet radius. An inclined plane of 1800 feet long, and 90 feet ver-

tical height, descends to the Susquehanna River, at Columbia. Arrangements are in progress to supercede one or both of these places, by a new location, presenting grades of about 80 feet to the mile, to be traversed by locomotive engines.—Vexatious delays are experienced on this road, owing to the fact that the State of Pennsylvania provides the motive power, managed by State agents, and gives to transportation companies only the privilege of attaching cars. This destroys that systematic arrangement throughout the line which is necessary on a work of this kind, and which uniformity can only be adequataly secured by subjecting the whole business of transportation to the sole management of one set of agents.

5th. The Newcastle and Frenchtown Railroad, length 16 miles, and no ascent over 25 feet per mile. The train of cars containing sixty passengers, was taken at the rate of 18 miles per hour. The greater portion of this road is either straight line or curved upon a large radius.

6th. The Baltimore and Ohio Railroad, which is in operation only as far as Harper's Ferry, length 82 miles. In travelling over this road I was favored with the company of P. E. Thomas, Esq., President of said road, to whom I am indebted for the followinging information. Between Baltimore and Ellicott's Mills, a distance of 15 miles, the road is level from 7 to 8 miles, and the remainder ascends at the rate of from 13 to 21 feet per mile. From this point 23 miles west, the line ascends from 18 to 38 feet per mile. This part of the line presents generally a succession of curves to the right and left, varying from 318 to 700 feet radius, and many of them as small as 400 feet. The grade in the next four miles rises from 38 to 45 feet per mile. A part of this is straight, and the remainder curved from 600 to 1000 feet radius, with the exception of a few of the curves, which are larger, making the distance 42 miles to the foot of plane No. 1, on the east side of Parr's Ridge. An engine of seven and a half tons gravity, took two passenger cars 30 feet long, containing fifty passengers, from Baltimore to this point, at the rate of 14 miles per hour, and passed over the assents and curved lines with the same velocity as upon the straight line and levels, and upon the last mile, which has an ascent of 45 feet, at the rate of 16 miles per hour.

We could have travelled over the 42 miles with greater velocity, had not the general regulations of the company limited the speed to 14 miles per hour.

The principle ridge encountered between Baltimore and Harper's Ferry is called Parr's ridge, the summit of which is distant 44 miles from that city, and presents an elevation of 817 feet above the tide level. At the time when this road was located over this ridge, about the year 1829, it had not been supposed to be practicable to ascend with locomotive engine with loaded trains, upon grades exceeding 30 feet to the mile, and therefore, in order to pass this ridge, four inclined planes arranged for stationary engines, were adopted at grades respectively of 76, 87, 176, and 253 feet per mile Since the recent improvements, however, in the Baltimore locomotives, much exceeding in power the comparatively feeble engines imported from England, the Baltimore and Ohio Railroad Company have resolved to locate anew this section of their road so as to dispense with these planes, and to adopt a more circuitous route over the ridge upon which the grades will be reduced to 80 and 100 feet per mile, and will be passed exclusively by locomotive engines. The planes as now located, are passed by applying auxillary horse power, but they have been lately surmounted with one of the Baltimore locomotive engines, drawing 33 passengers and other freight. The lengths of these planes are respectfully as follows: 2150, 3100, 3400, and 1900 feet, and the aggregate distance from the foot of the most easterly to the foot of the most westerly plane about four miles.

I was informed by Jonathan Kight, Esq., Chief Engineer of that road, that it is proposed to pass the ridges of the Alleghany mountains lying west of Cumberland, exclusively with locomotive power, encountering grades from 50 to 100 feet to the mile, and containing an aggrgate length of about 55 miles. That company estimate the actual cost of traction on those heavy grades at *two* cents per ton per mile, and on the grades less than 30 feet to the mile, at less than one cent per ton. The road with the planes as now located, is very extensively used for the transportation not only of passengers and merchandise, but also of flour, lumber, tobacco, and the general agricultural products of the country. The nett revenue for the year 1835, arising from the section of 82 miles of this road now finished, after deducting all expenses of transportation and repairs of the road and machinery, amounting to $107,163 71, being an advance of about 35 per cent, on the nett revenue of the preceeding year, which was $72,574 14.

7th. The Baltimore and Washington Railroad, which diverges as a branch from the Baltimore and Ohio Railroad, at a point 9 miles west from Baltimore. The length of this road from Baltimore to Washington is 40 miles, and is traversed by a locomotive engine of 7 and a half tons, drawing passenger cars which are 34 feet long, and unusually commodious, containing 70 passengers, together with the baggage car, at a velocity varying from 16 to 20 miles per hour.

On my return from Washington to Baltimore, the same engine drew three of these large passenger cars containing 140 passengers, together with the baggage and baggage car, at the same speed before mentioned.

The locomotive engines are able however to travel much faster upon this road, having passed a number of times from Baltimore to Washiugtan in one hour and a half, conveying from 75 to 100 passengers, passing over a part of the road at the rate of 40 miles per hour upon a straight line. An agreement was made to deliver the president's message in Baltimore in 40 minutes, or at the rate of 60 miles per hour, and it would have been accomplished but for the circumstance that after the engineer had started and obtained the velocity proposed the fireman became alarmed at the speed and put out his fire. The engines upon the different Railroads above mentioned, have horizontal boilers, and generally burn wood. Those upon the Baltimore and Ohio Railroad, and the Baltimore and Washington Railroad use anthracite coal, and have vertical boilers. This plan of engines I consider preferable to those with the horizontal boiler, particularly upon steep grades, as it prevents the water from varying from its place. The use of coal is also preferable as well on account of bulk, as in maintaining a more uniform and regular amount of steam; and in avoiding the smoke and sparks, which are found exceedingly inconvenient, unpleasant, and even dangerous, on the roads where wood is used.

Notwitstanding the very great improvements which the locomotive engine has experienced within the last seven years, I have no doubt that it is destined to undergo alterations which will still further augment its power and usefulness, and enable it to travel with safety at the rate of 30 miles per hour, with passengers, over grades varying from 10 to 30 feet per mile, where the curves are of not too small a radius.

I consider the engines made at Baltimore better than those that are imported from abroad. An English engine arrived at Baltimore a few days since, which was destined for a Railroad in Virginia; but being tried upon the Baltimore road, ran off the track once or twice. The foreign engines appear much better calculated for very straight and level roads, than those which must be constructed in this country.

The State of Pensylvania has expended $100,000 for English engines, but has recently concluded to abandon the use of them, and hereafter to order their engines made in this country.

It has been ascertained by actual experiment upon the Baltimore and Ohio, and the Baltimore and Washington Railroads, that one of the American locomotives, weighing 8 and a half tons, will draw upon a level road, 200 tons of freight, at the rate of 10 miles per hour: that the same engine will draw upon an ascent of 25 feet per mile 100 tons, and 50 tons on a grade of 50 feet, at the same rate of speed; and that by adding another auxiliary engine of the same power, the same weight may be propelled with the same velocity on a grade of at least 90 feet to the mile.

By a comparison of the facts above ascertained, with the table of grades and curvatures on the New-York and Erie Railroad, the advantage will be found much in favor of the latter. There is no grade on the New-York and Erie Railroad which will exceed 90 feet per mile, and that only for one and a half miles in distance, upon the western slope of the Shawangunk Ridge. There are a few places where a grade from 60 to 80 feet per mile for a short distance will be required; but or much the greatest portion of the road the grade will

reduced within 30 feet per mile. There ill be no curves on any part of the road ss than 700 feet radius, and but one as nall as that, and we have fortunately been ble in all cases where we have been comelled to adopt curves which would have therwise diminished the usefulness of the ngine, to regain the portion of power hus lost, by reducing the grade in that part of the road, and thereby to equalize the loss by curvature by a corresponding gain in acclivity. The loss of power on a curve of 700 feet radius, at a speed of 12 miles to the hour, is found in actual practice, to be about equal to an increase of acclivity of 18 feet to the mile, so that it is only necessary to flatten the grade to that extent, wherever we have been obliged to submit to a curvature as sharp as that presented by a radius of 700 feet,—and in that proportion for curves more gentle. It is by pursuing this plan, and thereby avoiding the excessive and useless expense incurred in attempting, as it were, to *force a line* to a course which shall be absolutely straight and level, that we have been able to avoid the mistakes in that respect of the English engineers, and to reduce within so moderate an amount the estimated cost of the New-York and Erie Railroad. You will perceive that the curves upon the Baltimore and Ohio Railroad, are much more severe than those upon the New-York and Erie Railroad, being frequently on a radius of 400 feet, and once as high as 318 feet; and nevertheless their locomotives pass over these curves without difficulty, at the rate of from 14 to 16 miles per hour.

The rail used on that road is the flat plate rail, laid in part on wood and in part on stone. The different modes of superstucture presented by the roads above mentioned, together with the plan which will be most expedient for the New-York and Erie Railroad, I propose to make the subject of a future communication, and I beg leave to conclude by stating, that an examination of the difficulties overcome on the roads above mentioned, compared with the facilities as to graduation and curvature presented by the New-York and Erie Railroad, cannot but remove any doubts as to the feasibility or usefulness of the latter work.

All which is respectfully submitted
by your obedient servant,
JAMES SEYMOUR.

To JAMES G. KING, Esq. *President of the New-York and Erie Railroad Company.*

ILLINOIS CANAL.

We find in the Chicago American, of January 2d, the following extract from a letter in relation to the canal from Lake Michigan to the Illinois river. It appears that the bill had been lost in the House, but reconsidered. We sincerely hope the prediction of the writer will be realized, as we consider that work one of great importance in the general system of Inter-Improvement of the country.

"The house, this afternoon, *reconsidered* the vote on the third reading by a vote of 31 to 24. An attempt was then made to strike out the amendment, authorizing the election of Commissioners by the Legislature, but failed. The question being put on the passage of the bill, the vote stood, 29 to 26, so it passed!!

There is a bill in the Senate on the same subject, though somewhat different in its features. It has passed the first and second reading. Both houses adjourned till Saturday. Do not despair of the canal; compromise and concession *will* carry it through, *and the money will be raised* on the FAITH *of the State.*"

Yours, R.

UPTON'S ROTARY LEVER ENGINE AND BOILER.—The advantages of the engine are:—1. It occupies only a seventh part of the space of the common reciprocating beam engine of equal power. 2. It has neither engine-beam, crank, connecting-rod, parallel motion, governor, air-pump, hot-water cistern, nor any of the attendant expenses. 3. It is so constructed that, whether single or double, the steam operates upon the extremity of a lever, the fulcrum of which is the axis of the engine, as well as of the resisting force, as in the case of paddle-wheels fixed at each end thereof, or of coach-wheels for locomotion on land. 4. It costs less in the first purchase, and does nor require a tenth part of the expense in fixing or repairs, as compared with a beam-engine. 5. It can be made to operate alternately in opposite directions, by reversing the motion of the steam. 6. It is perfectly controllable, and may be set to work or stopped instantly by any person whatsoever, if necessary. 7. It has not half the friction of common beam-engines, and consisting only of about a dozen parts, will prove infinitely less liable to derangement, and thereby greatly increase the demand for them. 8. It can be entirely put together in the manufactory, and will require only a few day's fixing, instead of weeks, as beam-engines always occupy. 9. It is admirably adapted for steam cultivation, being the best constructed engine for steam-ploughing, grist-mills, and other agricultural operations. 10. It is the best application of steam power for canal, river, and sea navigation; can be fixed to the kelson of a ship, and the axis protruded through the sides by means of perfectly secure stuffing boxes, so that the paddles may be always under water, and more out of the way of the enemy's shot. 11. It will weigh the anchor, pump the ship, and discharge and take in the cargo. 12. It requires less fuel than beam-engines of equal power, and, by occupying less space, leaves more stowage-room for goods. 13. It will be found, from its simplicity and compactnesss, the best application of steam power for railways or common roads, and the most profitable engine for manufactories and mining operations. 14. It will propel a carriage at the rate of 14 miles the hour, including stoppages for water and fuel. 15. It will not weigh,—including boiler carriage, 16 passengers, half a ton of luggage, 75 gallons of water, and 3 sacks of coke in reserve—more than 5 tons.

The advantages of the boiler are:—1. Its decided superiority over all other boilers yet made, consists in its being founded on the well known principle of an air-furnace, which of all others is the best adapted for the purposes of combustion, and generating the most intense heat with the least possible expense. 2. It weighs less than any other boiler yet made, generating the same quantity of steam. 3. It is safer than any other boiler, as it carries its fuel and water in separate compartments, the giving way of any one of which does not interfere with the others. 4. It is stronger than any other boiler, from the peculiarity of its construction. 5. It consumes less fuel than any other boiler yet made. 6. It works either as a high or low pressure boiler.—7. It raises steam in less time than any other boiler, and is fed from the top, but may be constructed to be fed otherwise if required. 8. It is more durable than any other boiler, and any one of the compartments for generating steam may be taken out and repaired, or replaced by duplicates, in a few hours. 9. It is the best adapted boiler for shipping, ever discovered, being lighter, more compact, fed from the deck, and perfectly safe by not carrying its water in bulk; nor can any danger result, even should one of the steam chambers give way after a long wear and tear; besides which, it stands on its own legs, and requires no fixing or brick work. Notwithstanding which, its heat is prevented from being acted upon by the surrounding atmosphere, and the steam is collected and preserved in one of its chambers, placed in the midst of the fire and boiling water. 10. It is the best boiler ever made, whether for stationary or locomotive purposes, on land or water. [John Upton, Agricultural and Locomotive Steam-Engine Manufactory, 7 New Street, Southwark Bridge, London.]

From the same.

Description of a successful Experiment, with the Heated Air Blast, made at the Oxford Iron Furnace, New-Jersey.

During a recent visit to Oxford Furnace, in Warren county, New-Jersey, on some observations connected with the mineralogy of that neighborhood, my attention was drawn to an arrangement for applying the *hot blast*, which much interested me, on account of the economical simplicity of its construction, and the encouraging results obtained through it.

Upon expressing a wish to make public through the Journal of the Franklin Institute, this first successful experiment of the kind in our country, I was furnished by Mr. Henry, the enterprising conductor of the furnace, with a detailed description of the whole attempt. In a spirit of liberality worthy of all praise and imitation, he placed in my hands all his memoranda, exposing the history of the comparative efficacy of the hot and cold blast at this furnace, and furthermore, gave me possession of drawings of a new and improved form of the apparatus for heating, which he is now constructing, to be put into operation when the furnace again goes into blast.

In the hope that the brief account which I have to offer, may prove of some service in promoting the introduction of that which is confessedly the greatest of modern im-

provements in the important art of smelting iron, I beg leave to state the comparative trials of the two species of blast at this furnace, in the order in which the furnace was worked, the better to make their relative effects understood.

It should be borne in mind that this experiment, as far as it has yet proceeded professes to be merely a preliminary attempt, introductory to a more permanent arrangement, hereafter to be adopted; and it is felt to be defective, therefore, in several points. For example, the *temperature* of the air used in the blast was found to be quite too low to insure that full result which the mode of apparatus employed is supposed capable of yielding. The experiment was imperfect, moreover, from the absence of any precise instrumental observations to ascertain exactly what the temperature of the air was.

To make more intelligible the amount of benefit derived from the heated blast, it seems proper to furnish a brief statement of the capacity of the furnace, and its operation when under the cold blast.

Oxford Furnace passed into the hands of its present enterprising masters, Henry, Jordan & Co., in 1832, and was worked during that and the two succeeding years, on the ordinary plan, with cold air. The partial experiment with heated air was made during the months of June and July, of the present year, 1835.

The height of the furnace stack, from the tunnel head to the bottom stone, was, at first, 33½ feet, but was afterwards, in 1834, reduced to 31½ feet; the height of the hearth to the boshes is five feet; the inclination of the boshes was at first eleven inches to the foot, and was subsequently changed to ten and a quarter inches to the foot, at which it stood during the employment of the heated air.

In the more complete arrangement for applying the hot blast, about to be introduced, the inclination of the boshes is to be altered to nine and a half inches. This is in consequence of the increased temperature within the furnace making it necessary to give more support to the burden. The width on the boshes is six feet six inches, and in the tunnel sixteen inches.

With these dimensions, the rate of working, or yield, of the furnace, was—

In 1832, for nineteen weeks and four days, 327½ tons, or an average of 16.7 tons per week.

In 1833, the product of thirty-two and a half weeks, 638.1 tons, or 19.6 tons of iron per week.

During this year, the quantity of charcoal consumed in making one ton of iron was 243 bushels, of eighteen pounds to the bushel.

In 1834, still using the cold blast, but employing an improved quantity of charcoal, the product, for twenty weeks and five days, was 240.4 tons, or, 11.6 tons per week.

So low a product was due to the hard and refractory character of the ore then used. It was taken from a considerable depth, was very compact, and a portion of it yielded iron having the quality called red short. This year, the consumption of coal to the ton of iron, was 226 bushels of a coal weighing twenty-two pounds to the bushel.

In 1835, the coal being similar to that of the previous year, and the ore of its ordinary much better quality, the product of the iron was at the rate of 18.9 tons per week.

While the smelting with heated air was in progress, the consumption of coal to the ton of iron was only 165 bushels, being a saving, compared with the previous year, of sixty-one bushels per ton.

It should be mentioned, moreover, that the new blast was applied in the months of June and July, a season when the product of a furnace is well known to be less than its average rate for the whole year.

The charcoal employed in the Oxford Furnace is a mixture of oak and chestnut, about two-thirds oak. Much commendable care is employed in its manufacture, so that a cord of 128 cubic feet is required to yield at least forty bushels, of a capacity of 2356 cubic inches to the bushel.

The flux used is the blue limestone of th vicinity of Scott's mountain, where the fur nace is situated.

The ore smelted at this furnace is th magnetic oxide of iron. It is mixed wit but little foreign matter, and occurs in vein several feet wide, in Scott's mountain: makes an excellent, tough, bar iron, and i also well adapted, and extensively used, f making castings, and pig iron.

Description of the Apparatus for Heatin the Blast.

This plan of supplying the furnace wit air at an elevated temperature, is upon principle said to be in use in Germany. I consists in urging the cold air from the bel lows, through tubes laid adjacent to th most highly heated part of the furnace, i place of heating it by separate fuel, in an ap paratus detached from the furnace. Th

Fig. 1.

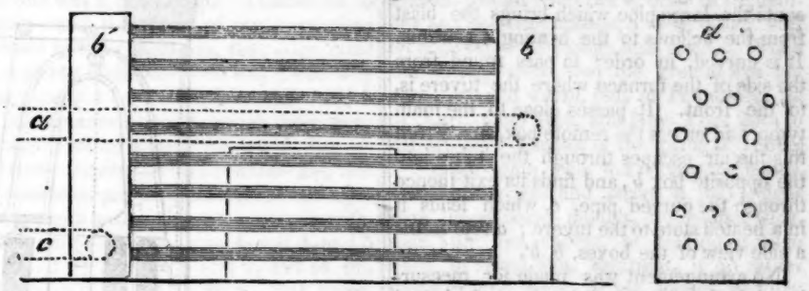
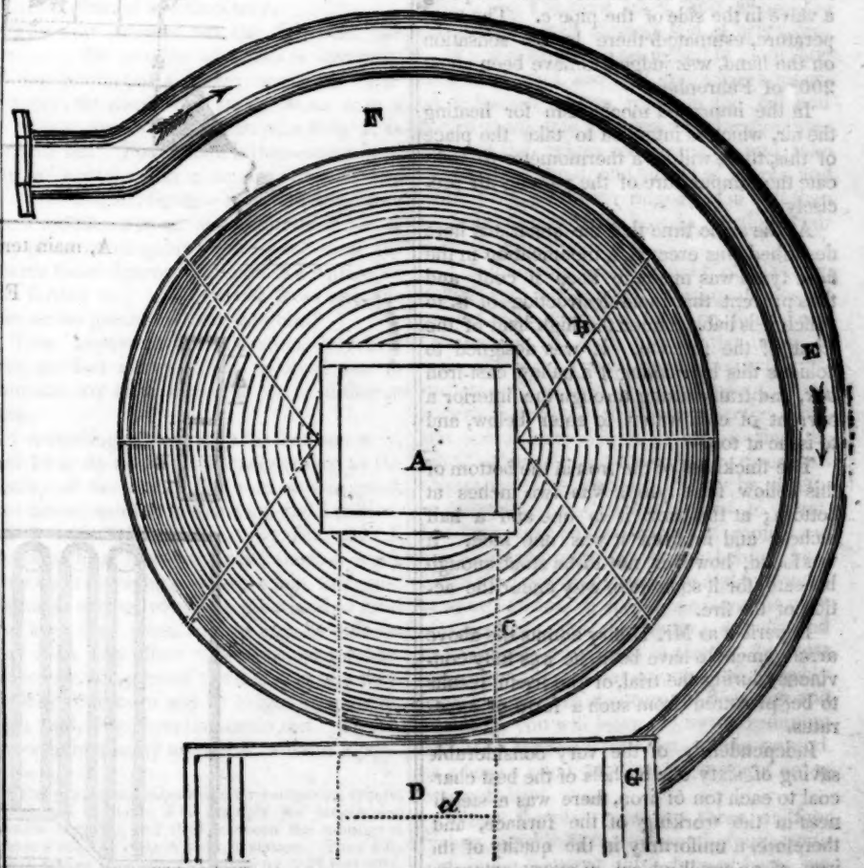


Fig. 2.



A, Oxford Furnace, hearth 20 by 22 inches; B, incline of boshes 9 inches to the foot; hearth line; D, position of the heating apparatus; E, hot air pipe; F, inwall; G, exi d, line dam stone.

contrivance is this: two hollow cast iron boxes, 2 feet 9 inches high, 15 inches deep, and 8 inches wide, are set into the masonry, on each side of the false tymp, and placed directly in contact with the main tymp, and with their broadest sides facing each other. A series of tubes, eighteen in number, pass from one box across to the other, and are so arranged immediately above the top of the false tymp, that the flame which plays in front of the main tymp, and under the sow, may pass around them as freely as possible. The interior diameter of the tubes is two inches. Their position in front of the hottest part of the furnace is such as to enable them to be highly heated, as well by the external flame, as by the heat radiated from the main tymp.

The air, in being urged through these tubes is, therefore, made to acquire a very considerable elevation of temperature.

In the diagram before us, fig. 1, *a* represents the large pipe which brings the blast from the bellows to the heating apparatus. It is curved, in order to pass round from the side of the furnace where the tuyere is, to the front. It passes close to the main tymp, and enters the remote box, *b*. From this the air escapes through the tubes into the opposite box *b'*, and finds its exit thence through the curved pipe, *c*, which leads it in a heated state to the tuyere; *d* represents a side view of the boxes, *b*, *b'*.

No arrangement was made for measuring the temperature of the air, as it issued from the second box, farther than adapting a valve in the side of the pipe *c*. The temperature, estimated there by the sensation on the hand, was judged to have been about 200° of Fahrenheit.

In the improved mechanism for heating the air, which is intended to take the place of this, there will be a thermometer to indicate the temperature of the passing air precisely.

At the same time that the apparatus here described was erected, a modification in the false tymp was made, to keep it cool, and thus prevent that rapid destruction of it, to which it is liable, under the high heat of the front of the furnace. It was designed to achieve this by making it a hallow cast-iron box, and transmitting through the interior a current of cold water, to enter below, and to issue at top.

The thickness of the iron in the bottom of this hollow false tymp, was two inches at bottom; at the back, it is one and a half inches; and in front it was one inch. It was found, however, not to be stout enough beneath, for it soon gave way under the action of the fire.

Imperfect as Mr. Henry admits the above arrangement to have been, he was fully convinced, during the trial, of the useful results to be procured from such a form of apparatus.

Independently of the very considerable saving of sixty-one bushels of the best charcoal to each ton of iron, there was a steadiness in the working of the furnace, and therefore, a uniformity in the quality of the iron, of no small object in every extensive establishment.

As a consequence of this regularity in the action of the furnace, it was found that the superintendence of the man who managed the tuyere could almost be dispensed with: so much so, that even after casting, during which the blast is usually taken off, no scraping of the tuyere was necessary to detach the congealed cinder which commonly adheres, proving how much higher the temperature of the furnace remains, when the heated air is employed. It would seem, indeed, that weather and season have little or no effect in deranging the working of a furnace driven by the hot blast.

It remains to describe concisely the other form of the apparratus for heating the air, which Mr. Henry is now constructing.

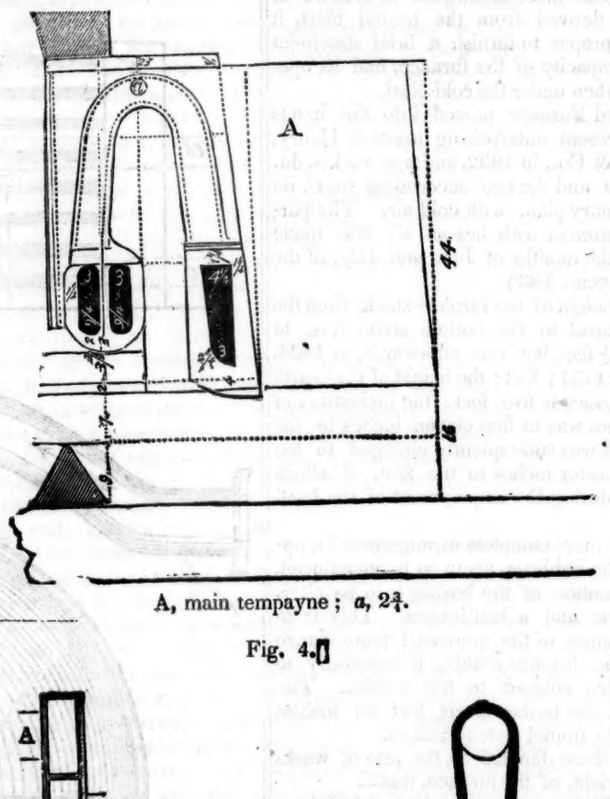
The object of this, which is upon the same principle as the first, but considerbly modified and improved, is to procure a higher temperature in the blast, and at the same time, to preserve the desired coolness in the false tymp, by passing the *blast* through it, in substitution of the water before employed. The false tymp is, therefore, hollow, and forms a part of the chain of connection through which the air from the bellows is made to circulate.

Fig. 2, shows the position of the semicircular pipe, which leads the cold air from the bellows, round the stack, to the side of the main tymp; here the pipe descends to enter the side of the false tymp, an end view of which is seen in fig. 3.

In fig. 3, a profile, or side view, is presented, of the manner in which the air is conveyed, from the interior of the false tymp, through a series of cyphon-shaped pipes, in the front chamber of a box, which lies in front of, and parallel to, the false tymp.

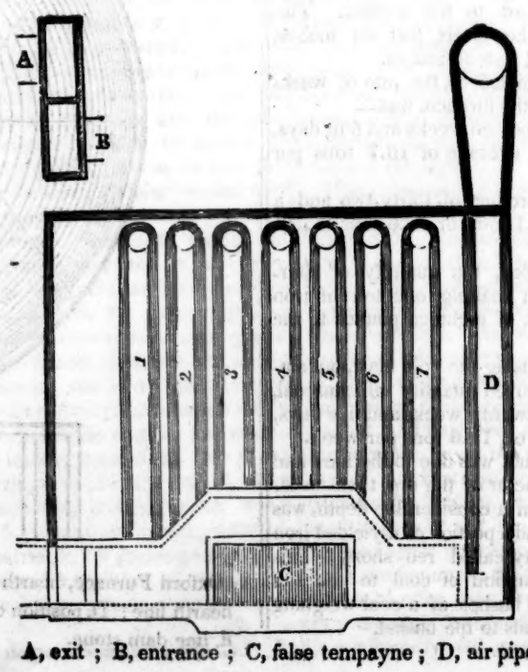
This box is divided by a partition into

Fig. 3.



A, main tempayne; *a*, 2¾.

Fig. 4.



A, exit; B, entrance; C, false tempayne; D, air pipe.

two chambers, an opening at one end of the partition permitting the air received into the front chamber from the pipes, to pass behind into the other; from this it issues through a large pipe, which curves round the angle of the furnace, and conveys the air to the tuyere.

Fig. 4, represents a front view of the anterior box, and the air pipes, seven in number, which connect it with the false tymp in the rear. The doorway in the middle of this front box is designed to permit the flame and heated air which play up near the dam stone, to pass between and envelope the pipes previous to escaping under the sow.

The whole is of cast-iron, the lower part of the walls of the hallow false tymp being at least four inches thick.

In the pipe which leads the air, heated by traversing the tymp, the tubes, and the two chambers of the front box, from the latter to the tuyere of the furnace, there will be a contrivance placed to receive a mercurial thermometer. It will consist of a tube of copper, of about one inch diameter, and six inches length, closed at one end, and the closed end inserted three or four inches through the side of the pipe, so as to expose it to the current of heated air which passes along the pipe, and which will impart its own temperature to it. This tube will be filled to a small height with quicksilver, and the thermometer bulb made a dip into the mercury. The scale of the thermometer will, of course, project out of the tube, that the temperature recorded upon it may be seen.

Mr. Henry intends keeping a daily register of temperature of the blast, and the state of the furnace. Such a register will be highly interesting, and we wish every success to the ingenuity of the liberal and enterprising masters of the Oxford Furnace.

Agriculture, &c.

From the Farmers' Register.

THE PROPER DISTANCES FOR PLANTING CORN.

I hold it to be an axiom, that any subscriber to a useful and punctual periodical, who does not contribute to its support, by paying his subscription, and furnishing any useful facts or theories of which he is in possession, is worthy of any punishment which a jury of editors would inflict.

Not choosing to subject myself any longer to the penalty due to such an offender, I send you my subscription and my mite of matter. The first will, I hope, justify you in paying the post, whether the latter is worth printing or not.

In this world of fancies and Yankee notions, each man has his hobby. Some ride to the south, some glide swiftly on the bosom of the smooth canal; some fly through the air in balloons; some rattle on a railroad, and I Mr. Editor, ride into my cornfield, and speculate on the value, while I am enraptured by the beauty of that queen of plants.

While all the world is agog for cotton, the poor corn is neglected by all but those who eat it. Let us turn our eyes to it, while I give you the results of some experiments and calculations on its culture.

On the Eastern Shore of Virginia (that most prosperous of all corn countries,) I am told it is the habit of the planters to plant their corn four feet each way—a single stalk at a place. When I first commenced farming, my impression was, that the most economical method of cultivating corn, all things considered, was to plant it so as to plough it both ways, and thereby dispense with the hoe-work. I tried it. Experience and reason have changed my opinion. In 1835, I cultivated a light sandy field in corn, (much such land as that on the Eastern Shore, but not so good.) Part of it I planted 5 by 3, and part (the best land) 4 by 4 feet—both were ploughed both ways, and received the same culture: the cut 4 by 4 was favored rather the most, because it seemed to suffer. The result was, the corn 4 by 4, suffered for distance, while that 5 by 3, had a plenty of room, and was a good crop. This set me to thinking—and the result of my cogitations amounted to the conclusion, that corn must have a plenty of distance one way; else why was the corn 4 by 4 too thick, while that 5 by 3 had distance enough—when there were more stalks on an acre of the latter, than on one of the former—which reminds me, that many persons, and they intelligent and educated farmers too, think—no, conclude without thinking—that because 4 and 4, and 5 and 3, and 5½ and 2½, 6 and 2, and so on, when severally added, make 8—that, therefore, there are the same number of stalks on an acre, planted in either way.

This you know is not the fact—on the contrary, the number of stalks is inversely as the *product* of the two numbers. For instance, the number of stalks on an acre 4 by 4, is to the number on an acre 6 by 2, as 12 is to 16. The reason is this—more land can be contained in a square, than in any other rectangular figure—consequently, there are few squares in an acre, than there are of any other rectangular figure—so, also, the nearer these figures approach to a square, or the farther they are removed from one, the less, or the greater is their number.*

This important consideration, together with the fact above stated, resolved me to cultivate my corn this year on a different plan.

I accordingly planted it 5½ feet one way, and 1½ to 2½ feet the other, according to the quality of the land. My corn was as good, and better, worked in this way, and I cultivated it with little trouble. By using an X wooden drag, twice in a row, about a week after each ploughing—first, when the grass begins to spring, you leave your land as level and keep it as clean, as you can by cultivating it in any other way—hoe or no hoe. Moreover, the greater the distance one way, the less your corn will be ridged by ploughing; and, therefore, the more dirt you can throw immediately around it without injury.

*The proper and simple rule for comparing spaces, or distance of plants, is to multiply the length and breadth together, and thus ascertain the number of square feet given to each plant, or station. Thus 4 by 4 feet, makes 16 square feet, and 6 by 2, 12 feet only. Yet simple and obvious as is this truth, it is both true and surprising, (as stated by our correspondent,) that many old and experienced corn planters still compare the spaces, afforded by these and other different distances, by adding, instead of multiplying the length and breadth together.—Ed.

If I am wrong in any of my deductions, I hope you, or some experienced corn planter, will put me right: for, until experience or reason changes my views, I will plant any land 6 by 2, which, according to old style, would be planted 4 by 4. There are ⅓ more stalks on an acre of the former, than on one of the latter. I contend the last is the thickest. In the mean time,

I am, yours, &c.

SIX AND TWO.

From the Ohio Farmer.

LOCATION, SOIL AND CULTIVATION OF THE MADDER CROP.

A location facing the south or south-east is to be preferred. A sandy loam not over stiff and heavy, or light and sandy, or a good brown, deep, rich upland loam, free from foul grass, weeds, stones or stumps of trees. Where a crop of potatoes, peas, corn or wheat, has been cultivated the past season, plough deep twice, once in September and once in October, and if rather stiff let it lie after the plough until spring. When the spring opens, and the ground has become dry and warm, (say in Tennessee, 1st of April, Ohio 15th, and New-York 25th to 1st of May; I speak of the spring of 1836.)

Plough again deep, the deeper the better, then harrow well and strike it into ridges with a one horse plough, three feet wide, and four feet vacant, or making a ridge once in seven feet, raising it, if on rather moist ground, eight or ten inches, and dry land six or eight from the natural level, then with a light harrow level, and shape the ridges like a well formed bed of beets, &c.

We will suppose you intend to plant one acre of ground, and that you have purchased 8 bushels of top roots in the fall and buried them like potatoes on your premises—count the ridges on your acre, and take out of the ground, one bushel of roots, and plant it on ⅛ of your ridges; you will then be able to ascertain how to portion your roots for the remainder.

The following is the manner of planting, cultivating, &c., when the quantities of ground do not exceed three or four acres. One person on each side of the ridge to make the holes, (plant four inches below the surface of the bed, or thereabouts, when covered,) one on each side to drop the roots, and one on each side to cover, pressing the hill like that of planting corn, or three persons on one side, as the case may be, whether your have one or more acres to plant. Let the owner be the dropper of roots, and his most thorough assistants behind him. Make the holes from twelve to eighteen inches apart, and about six inches from the edge of the ridge. As the plants are supposed to have been purchased in the fall, the roots may have thrown out sprouts, and possibly have leaved. In this case, in dropping and covering, you will leave the most prominent sprout or sprouts a little out of the ground. As where a plant has leaved, it ought not to be smothered.

When the plant gets up three or four inches, weed with the hoe, and plough with one horse, between the ridges or beds, but not on them; this will take place 2 or 3 weeks after planting. When up 12 or 15 inches, many of the tops will fall; assist them with a ten foot pole; two persons

cross them each way across the bed, cover them with a shovel or garden rake, throwing the soil from between the ridges. After loosening with the one horse plough, you will, with a shovel scatter the earth between the stalks rather than throw it into heaps; of course we wish to keep the stalks separate, as they are to form new and important roots in the centre of the beds. About the 20th of June, you may plough between the beds, and scatter more earth on the fresh tops, (all but the ends) and when you get through, you may plant potatoes between the beds if you choose. I do not recommend it, if you have plenty of land, although I raised 1070 bushels of Pink Eyes on eight acres the first year, and 60 bushels of corn. If your land is perfectly clear of weeds, you are through with your labor on the Madder crop for this year, except in latitudes where there is not much snow, and considerable frost; in this case cover in October two inches or thereabout. 2d year; same operations, in weeding, but no crop between; cover once in June. 3d year; weed only; 4th year; weed in the spring, if a weedy piece of ground.

Begin to plough out the roots in Tennessee, [3 years old] first Sept. Ohio [4 years] same time. New-York, 15th or 20th, after cutting off the tops with a sharp hoe. In ploughing out the roots use a heavy span of horses, and a large plough. We ought to choose a soil neither too wet or too dry, too stiff or light. Shake the dirt from the roots, and rinse or wash, as the soil may be, stiff or light; dry in a common hop kiln; grind them in a mill after Wilson's Patent Coffee Mill; this mill weighs from one to two pounds. The madder mill may be from 60 to 80 lbs. weight. Grind coarse, and fan in a fanning mill; then grind again for market. The profit of this crop is immense; the exhaustion of soil trifling, and glutting the market out of the question.

The Editor of the Albany Cultivator, vol. 2, page 20, says—"It is principally cultivated in Holland, the province of Zealand, being literally covered with it, from whence it is exported to every part of Europe and America, yielding almost incalculable profits. The import of this article for the use of our manufacturers, is said to amount in value, to more than two millions of dollars annually." Mr. Jefferson, while minister in France, writes: "They cultivate madder here at immense profits; they dig it once in five or six years." I have before me a communication from a cultivator of the article, (see Cultivator, vol. 2, page 93,) who makes the clear profit to amount to $888 30, on an acre once in four years. The lowest amount of profit that I have known on an acre in four years is $300; the highest 1200; this last included the sale of top roots for planting. The amount will vary according to the soil and cultivation. I have unquestionable evidence that one hill (2400 to the acre) has produced in five years, 4 lbs. of kiln dried madder; another at five years old, 6 lbs., another wherein they took uncommon pains with the hill, 8 lbs. 8 oz. Mr. Woodbury of Winfield, Herkimer county, N. Y., the writer of the abovementioned communication, purchased in the fall of 1834, one-fifth of an acre of madder 4 years old and planted in hills, (far less productive than if planted in ridges) for which he paid $80. and dug from it one thousand one hundred pounds. After it was kiln dried, he sold it for 18 cents the pound. The usual yield for four years is 3 pounds to the hill, where the land is first rate, and the cultivation is performed by a snug farmer. The crop increases something like the following ratio viz. 1st year, small growth. 2d, double, 3d, equal to the two first. 4th, equal to 15 per cent. on the whole; at least this is my opinion, not having dug any that was five years old. Madder grows, and the stalks are fresh, in any of the middle and western States until killed by a hard frost, and is almost the first vegetable that starts in the spring, hence I should suppose that madder in Tennessee, at 3 years old, would be equal to four years at Birmingham, Ohio; four and a half, Oneida county, New-York; five years Winthrop, Me. The cultivators of Holland and France, from whom we draw most of our supplies, and most of the agricultural authors of those countries have been silent on the subject.

I am located in the rich bottoms of the Vermillion river. I, in connection with another person, plant this spring 10 or 12 acres. As I have always been of the opinion that a madder soil should be composed in a great degree of decayed vegetables, I think I shall get in four years from 5 to 6000 lbs. of dried Madder per acre. I have a good upland 1½ acres, planted some time since, from which I can spare enough roots next fall, to plant 6 or 7 acres. The price will be, in the fall, for 6 bushels, $24; over 6 and under 12, $3 50 per bushel; over 12, $3.

Birmingham is 38 miles west from Cleveland, Ohio, and 14 miles south-east from Huron, Ohio. Messrs. Wickham & Co., Forwarding Merchants, Huron, will be applicant's agents, to whom funds may be forwarded for the purchase of roots; P. E. & E. B. Bronson, Birmingham, owners, or R. Bronson, Manager. All letters on this subject must be post paid to meet with attention.

I had been in the practice of using the "Rubin Tinctorum, or Dyer's Madder," for many years previous to embarking in the business; and before I commenced, I ascertained that the price of the imported article, was worth (the preceding thirteen years, on an average, in the New-York market,) 15 cents per lb.; the ten years preceding the thirteen years, it was worth 25 cents, and in that time have known it worth 44 cents. In my early communications to Editors of agricultural papers, I stated the crop would equal 2000 lbs. 3 years old, but did not dream that 4 years would produce an average of 4000 lbs. on good land and good culture. The cost does not exceed 4½ cents per lb., exclusive of selling top roots for planting. They may be sold with profit at three years and even two years old.

It is surprising to me that no more than sixty acres is as yet under cultivation. There will be about one hundred acres planted this spring, and from forty-five thousand to seventy-five thousand acres wanted for the consumption of the United States, and England as she cannot grow the articles, imports all she uses. I say she cannot grow it to advantage; her summers are too moist and cool. It is more absurd to let foreign nations export madder to this country, than to let them export wheat or wheat flour. It is more hardy than the potato crop. It is worth three cents more per pound, than the best imported. As a proof, no imported madder can be sold where this has been kept for sale. The difference consists in this, that the brightest roots are selected in the field in those countries, dried and ground, and sent to England. They use it in dyeing their Adrianople, or Turkey red, on cotton; the rest dried, (without rinsing) ground, and sent to America. In this country, a prundent cltivator rinses, dries, and grinds altogether; then fans or separates the loose bark and small fibres from the pure article. The refuse is used for ground of many colors.

Madder is used in whole, or part, for the following colors on wool, both in England, France, and Amarica, viz: blue, black, red, buff, olive-brown, olive, navy-blue, and many others; finally it produces one of the most beautiful, durable, and healthy colors that is at this time dyed; as for calico printers, it enters greatly into their dyes. The city of Lowell, in Massachusetts, uses thirty thousand dollars worth per year. A war with France would raise the article to thirty-one cents per lb., in the New-York market. One small establishment in Otsego county, New-York, uses equal, each year, to three-fourths of all that is raised in the Northern States at this time.

The reader will now inquire why have not the farmers in the United States, entered into the culture of this article, and completely glutted the market? I will answer, that most of them want their profit at the expiration of each year, not thinking that the horse or ox is four years old before it is profitable to sell. But there is another difficulty. I have before observed that there was wanting, for the consumption in the United States, from 45 to 75,000 acres. The amount of Madder roots, for planting, dug last fall, was 1000 bushels. There will be planted this spring, say something more than 100 acres; next fall there will be for sale, roots amounting to 250 bushels, and next year, enough to plant 200 acres. Probably it will take ten years or more, to procure a supply of roots to plant, equal to the consumption of 1835—6 or 7. I have before me a communication from a respectable correspondent, detailing the mode of cultivation in Holland and France, together with queries, requesting my answers, which I will most cheerfully give, and will be forwarded to be inserted in your paper, should you deem the above worthy of publication.

I have for many years past, believed that the soil and climate of Ohio, was peculiarly favorable to the culture of silk, madder, and the grape for making wine; and having resided here in course of the last and present years, several months, I have been more and more confirmed in that opinion. What hinders this State from rising in rank above New-York? Let every farmer take an agricultural paper, and improve the privileges that nature has given them. I have examined the soil and privileges of this county in particular, and do not hesitate to say, I believe that it equals any part of the United States. There is, I believe, no desirable

fruit or grain that grows north of Philadelphia, but what flourishes here. It is certainly a most desirable soil and climate, compared with that of the middle counties of New-York. Many of the farmers of this section, only skim the surface of the land with the plough. What hinders the water, in the spring and fall, from settling in the ground through the sub-soil, and bursting out in springs?——Shallow ploughing. What hinders the farmer from obtaining thirty bushels of wheat to the acre?——Shallow ploughing. I wish I were able to commit to paper all I feel in favor of manual labor or agricultural schools, backed by numerous agricultural papers, containing communications from a Buel, a Colman, and a host of other scientific and practical farmers. I am not a practical farmer, in a large way, myself, but the aid I have received from perusing those papers, for a few years past, has been of great benefit to me—yes, ten times the expense of four agricultural papers per year.

Not being brought up on a farm, how could I exercise judgment in the selection of a horse, ox, sheep, or hog? I read the communications of writers of acknowledged reputation, on the subject, and compared their arguments with my own reason, improved by previous reading, and made my choice. How should I be able to select and cultivate the various grains and grasses, or to till the ground to a proper rotation of crops, or select and engraft with my own hands the best fruits in the country, and last, though not least, to have a good garden?

I might go on and multiply reasons why I will patronize agricultural papers; but knowing my inability to do justice to the subject, and fearing your readers will think I am fishing for some particular individual, I will conclude with wishing you and your brethren in the cause, many subscribers, and that you will consider me one of them.

R. Bronson.

Birmingham, Huron County, Ohio.

From the Farmers' Register.

FARMING ON THE RIVANNA.—CORN CULTURE—CLOVER—MANURING.

November, 23d, 1836.

Admcnished twelve months ago, as well by a sense of duty, as by repeated calls on the subscribers to your valuable journal, for practical communications—I then devoted part of a rainy day to giving to it a modicum of my experience. But unwilling to obtrude my opinions on the public eye, sharp-sighted as it had become from light recently shed on your paper by a discussion among some of our most distinguished agriculturists, I declined offering my meager essay at so inauspicious a period.—*Another rainy day*, however, and the annual business of arranging papers, force it on my notice, and I fear you will have cause to regret that there are not still combatants on the arena, from whose observation I might willingly hide my diminished head. And yet, having made agriculture my profession from the outset of a business life of more than twenty years, I feel more unwilling to acknowledge ignorance than to expose, as I may do, the imperfections of a practice, which has not been without its success. Not entering on the wide field of the vexed question of *rotation*, further than it must necessarily be involved in the tendency of my remarks, I shall content myself with defending *that* which I have practised for 15 years—avoiding any attack on other systems; and thus, Mr. Editor, I hope to escape the ungloved handling to which a different course might subject me.

Although standing under the shadow of a name which would give but little weight to the manuscript that has so long laid on the shelf, I still feel a repugnance at the egotism of entering so minutely and personally into details that may afford little, or *no* benefit to your readers—and therefore, as *some apology*, (though at additional expense to your columns and *their* patience) have ushered it in with this exordium.

It is not unimportant to mention that four-fifths of the arable lands of the farm which is the subject of this communication, consist of what is denominated, above the falls of James River, first and second low-grounds, which being level or gently undulating, with generally a deep soil, admit of the advantageous use of four-horse ploughs—not admissable on rolling, or shallow lands. This farm was put under a three-field course in the autumn of 1832. Field No. 1. being then sown in wheat was laid down in clover, for *the first time*, in January following. Nos. 2 and 3 taking their rounds in corn, &c. wheat and clover, it will be seen that No. 1, comes under cultivation for the crop of 1835. The clover having been very fine, without a hoof, and scarcely a scythe put into it, the land was in a condition to give its best return.

As in the preparation for, and cultivation of the corn crop, it involves many of the details of the three-field system, and from its intrinsic value and the labor usually expended on its culture, constitutes as important an item in Virginia husbandry as any other—I will submit my plan of managing it through all its stages.

The above field, (No. 1.) was laid into beds of 14 feet width, by four-horse Loudoun bar-shares, carrying furrows from 8 to 12 inches deep, (according to depth of soils,) and 17 wide. The corn, and tobacco lands being selected, as well for their fertility as level surface, on account of the liability of broken lands to *wash* in hoe-crops, were first ploughed. This being done before the new year, they were put in the finest tilth by the agency of frost, assisted by the opening effect of a clover ley and deep ploughing, with its necessary adjunct, cross-draining, by *deep-grips*.

As soon in March as it is *perfectly* dry, the corn-field is harrowed diagonally across the beds with heavy wheat-drags. At the time of planting, when the earth is warm, and buds begin to spring, (regardless of dates,) the same drags are passed three times lengthwise the bed—three rows being laid off on each, with a single mould-board plough, carrying a clear furrow from 2 to 3 inches deep. The seed corn having been steeped in liquor from the farm-pen, one night, and rolled in plaster the following morning, is dropped by hand, from 4 to 6 grains in a place, (as I am opposed to replanting,) at the distance of eighteen inches. It is then covered with an implement—being a frame with two coulters placed side by side—the frame so closed as to bring the coulters *just* within the laying off furrows. This raises a slight list over the grain which prevents the taking effect of the hasty rains, and acts as a cultivation. Hoes follow after, brushing off the clods that may be left on the list and covering exposed grains. When the corn is about six inches high, single horse mould-board ploughs are introduced—commencing their operation in the middle of the balk with the bar next the corn, flushing the whole and finishing as near as they can be gotten to the row. A coulter follows in this finishing furrow, with the foot of it so turned under, as to move every plant in passing. Then come the hoes trimming down this narrow ridge, and thinning to one stalk, except where there are missing hills, in which case, leaving two or more stalks to make up the deficiency. I also leave two stalks in every alternate or third hill, in extra rich parts of the field. As soon as the stalk will bear a heavy earthing with the same ploughs, the balk is thrown back. On account of leaving the field in the dryest state for wheat sowing, I give the water-furrow rows 5 feet distance—*laying by* the three last furrows with a two-horse mould-board plough.—This operation finishes the working of the field. My reasoning on which practice is, that a heavy clover ley being made by four-horse ploughs, beyond the reach of disturbance from the smaller ploughs, or the deleterious influence of the sun, affords a rich moist pasture for the roots of this greedy and thirsty plant, which I have observed, will maintain its color in *almost any* drought on this system.

I would not recommend beds of 14 feet width on *wet* lands—nor do I think them as suitable for corn *alone*, as narrower beds with two rows, as the middle row has the advantage of the others, and will *keep it* throughout its growth. But for wheat and clover, I give that width the decided preference. In ploughing such beds for wheat, after corn, they cannot be reversed with fewer than four horses, without leaving them too low in the middle. I therefore *raise* them with two, by first throwing out the corn stubble of the inside row, with a wide furrow, then filling it by running *wide* on each side; this gives to the beds a handsome arch, without leaving them too high.

To return to the corn crop, however, I housed from fifty-nine acres of the low ground division of the first field, (which is inferior to a large proportion of the second low grounds of the same,) 740 barrels of sound and large ears—the average yield being reduced, by the balance of that division having been taken off for tobacco, which requires the richest land. The advantage to the crop of corn from further working than is here stated, would, I think, be trifling; yet on account of the succeeding wheat crop, I would give about harvest, or immediately after, a *very shallow* brushing over with cultivators or hoes. But

having under my system *full* crops of corn, tobacco, and oats, besides timothy meadows, all pressing at that season, it would certainly be injurious to bestow more labor on *that one*. In commendation of a clover ley with deep ploughing and efficient draining, as a preparation for corn, let me say that my predecessor told me after the above mentioned result was ascertained, that the same field, when I became possessed of it three years before, would not have yielded more than five barrels per acre. He too is a manager of high reputation; but had not enjoyed (having been an agent) the advantages of clover and its indispensable adjunct, *plaster*. These, with the exception of a thin top-dressing of *stained* straw on, perhaps, two acres of land in the same field (which had been abraded by freshets,) when it was in wheat, constituted the only manuring of the field. Although this teeming production cannot justly be charged, in the *first* rounds, to the three-field course, it certainly speaks loudly in favor of the rotation of corn after clover, particularly, when the succeeding wheat crop (of this year) was better than has been generally obtained this season. As to the result of a fair experiment of the system, I can only say, "*nous verrons*;" but must be permitted to add, that the *same* practised for 11 years on James River, on a farm less *kind* in proportion to fertility, exhibited a regular improvement.

Before taking leave of this branch of my subject, I must insist on the importance to a great product, of a close and regular distribution of the corn stalks—one only in a place—to prove which, I will give the result of *one* of the many experiments I have made. A frost occurred in *this county* in the spring of 1834, which cut down the corn below the surface of the earth, and appeared to have totally destoyed it. Field No. 3, was in that crop, 80 acres of which had been nicely weeded out with hoes and ploughs. I caused 3 intermediate rows to be laid off and planted in rare-ripe, making 6 on a bed of 14 feet width. A genial shower having occurred in the course of a week, the six rows came out together most beautifully. The first planting of course had the preference: but of the rare-ripe, five rows were left in the richest, *convenient* part of the field. One corner, containing 4,000 square yards, lying in such shape as to be measured with accuracy, (the corn no better than the balance similarly planted,) yielded 14 barrels of fine ears.

You, Mr. Editor, as well as your readers, are doubtless heartily tired of No. 1 but in justice to the three-field system, must be allowed to dispose of the remainder of it. The tobacco and corn land being done with, that portion of the field requiring cleansing of pests, is put in oats; the fairest crop of clover—that is, that which is most clear of pests, which is generally on the hills in each field—is reserved for fallow in August and September.—Thus, as regards the clover fallow, mine is a modified three-field course. The whole field having been sown in wheat this fall, will be laid down in clover and other grasses, according to quality of soil and other circumstances, from the first of January to the middle of April, always applying plaster where the young clover assumes three leaves—which depends on the season. I will here remark, that I have succeeded best with clover sown in January. The open condition of the earth, from the effect of frost, takes the seed in deep enough not to be operated on by a sudden thaw which might cause them to vegetate on the surface, thus exposed to frost, and that still greater enemy to clover, drought: whereas, when buried more deeply, the seed vegetate at a later and more regular season and are protected against being thrown out by the former, or killed by the latter enemy. With all spear grasses, (under which I class those in most common use with us, that is, timothy, herds, and orchard grass,) I have found most success, (*after* the months of August or middle of September,) when sown from the 15th Marth, to the same date in April, because of the peculiar liability of these to be thrown out by frost, and therefore, their requiring good roots to resist it.

When the farm-pens are broken up in March, the whole of the manure from *them*, as well as that which has been made in the stables since the winter top dressing on wheat, is hauled out and ploughed in on tobacco, corn, and oat lands, which being in clover, require light and partial manuring. After that period, all that can be made by littering stock of every description liberally, is reserved for top-dressing at the time of sowing wheat, if there is leisure, (which I rarely have,) and during the frozen spells of winter. I find the stable manure best for winter dressing, as it goes further, being little more than well stained straw—and from its warmth, separates more easily in frozen weather than others. I also top-dress very liberally with wheat straw, thinly scattered on poor or galled spots of the wheat field, for which there might not have been a sufficiency of manure. The crop of young clover is insured by such dressing—as I have found plaster to act most efficiently on unrotted manure. I consider all top-dressing more or less injurious to *wheat* (unless harrowed in at the time of sowing, and in that case thoroughly decomposed,) as it affords a nursery for insects during winter, which prey on the crop in early spring.

Let me here take a passing notice of the modern system of reserving all the manure of a farm, for *surface manuring*. Among the objections to this plan, these strike me as most prominent. In the first place, the loss to the land which it is destined to enrich, of the fermenting process under furrow—this I consider material. Then the waste in the manure itself, from evaporation, and *very* often, the total destruction of it from *fire-fang*. Suitable spells for applying it in winter, are precarious—and if the whole offal of a farm, as well as the leaves of woodlands convenient, are converted into manure, it will be found that the ordinary force of a well regulated, and of course, profitable farm, cannot accomplish the hauling and scattering of the *whole* stock. There are other seasons at which the teams and hands of a farm, on which due attention is paid to the division of labor, cannot be profitably employed unless in hauling and collecting manure or materials for it. Few applications of manure are more profitable, I consider, than that of covering the thinner parts of a clover field, after that portion intended for cultivation has been attended to. In these, the clover shoots through the covering before the scorching suns of summer occur, and protects the manure from evaporation, while the plant is generally repaid by the nourishment it receives. To conclude this chapter, let me pay a just tribute to that *multum in parvo*, plaster of Paris. Removed from the benefits so providentially given to the tide water country, in the abundance of marl and lime at command, we should feel that our region was shut out from the face of nature, but for this richest of earthly blessings as a boon bestowed on us, for the wisest and most beneficent of purposes—though by injudicious practice, it has, I am sorry to believe, been productive in *its early abuse*, of as much injury as benefit to dear old Virginia. The practice to which I allude is that, of first stimulating the earth to an unnatural product of clover, and then robbing it of every spice—the result of this great effort—by the scythe and grazing, unaided by standing pasture, which is indispensable to *any improving* system.

I have thus, Mr. Editor, given you a faithful transcript of this record of my *practice*, as far as it goes. Could it have been abridged without mutilation, or doing violence to the unpretending object of the writer, it would have been: and I may add, should its destination, in a luckless moment to your readers, be the columns of the Register, instead of its more appropriate *shelf*, they may be assured, that tedious as is the task its perusal imposes, *they cannot* be more objects of commiseration, than he who seeks in so dull a detail a solace from labors that he would fain forget, in that crowning reward of the farmer's toil, which a domestic fireside *alone* can give.

James River having gathered into her garners the greatest share of the profits of Virginia agriculture, and her farmers occupying, justly, the highest eminence of its fame—far as I am from detracting from either, especially the latter ascription—I should be recreant to the land of my adoption, were I to withhold from it the designation of my signature.

RIVANNA.

A patent drag, or coach-retarder has been tried, during the last few days at Highgate-hill. The principle of this machine is, that by increasing the pressure on the boxes of each of the hinder wheels, the friction is increased to such an extent as to stop the progress of the vehicle. This is managed by means of a lever with springs acting above and below the box of each of the hind wheels, and can be very easily applied by any person on top of the coach. The trial was perfectly satisfactory, as the machine stopped the coach instantly while going down hill at a considerable speed.